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 GM-Eintragung vorbehalten.

ALLGEMEINE TECHNISCHE ANGABEN

GENERAL TECHNICAL DATA

Netzteil

Energieversorgung:

- 1) Extern 9 V/400 mA
- 2) 6×1,5 V Monozellen
IEC R 20 (10 µA bei Netz aus)
- 3) 2×1,5 V Mignonzellen IEC R 6/
Stützbatterie für Mikroprozessor
und elektronische Uhr

Power supply unit

Power supply:

- 1) External 9 V/400 mA
- 2) 6×1.5 V cells
IEC R 20 (10 µA power off)
- 3) 2×1.5 V cells IEC R 6/
buffer battery for micro-
processor and clock

Tuner

Wellenbereiche:	UKW 87,5 ... 108 MHz
	MW 520 ... 1620 kHz
	LW 150 ... 281 kHz
	KW1 2,3 ... 2,5 MHz
(UKW: 50 kHz-Schritte, sonst 1 kHz-Schritte)	KW2 3,2 ... 3,4 MHz
	KW3 3,9 ... 4 MHz
	KW4 4,75 ... 5,06 MHz
	KW5 5,8 ... 6,2 MHz
	KW6 7,1 ... 7,5 MHz
	KW7 9,5 ... 9,9 MHz
	KW8 11,65 ... 12,05 MHz
	KW9 15,10 ... 15,6 MHz
	KW10 17,55 ... 17,9 MHz
	KW11 21,45 ... 21,85 MHz
	KW12 25,6 ... 26,1 MHz
	AM 150 ... 29999 kHz

Tuner

Ranges:	FM 87.5 ... 108 MHz
	MW 520 ... 1620 kHz
	LW 150 ... 281 kHz
	SW1 2,3 ... 2,5 MHz
	SW2 3,2 ... 3,4 MHz
	SW3 3,9 ... 4 MHz
	SW4 4,75 ... 5,06 MHz
	SW5 5,8 ... 6,2 MHz
	SW6 7,1 ... 7,5 MHz
	SW7 9,5 ... 9,9 MHz
	SW8 11,65 ... 12,05 MHz
	SW9 15,10 ... 15,6 MHz
	SW10 17,55 ... 17,9 MHz
	SW11 21,45 ... 21,85 MHz
	SW12 25,6 ... 26,1 MHz
	AM 150 ... 29999 kHz

Empfindlichkeit:
 UKW (S/R = 30 dB) < 15,9 μ V
 MW (S/R = 20 dB) < 1,26 mV
 LW (S/R = 20 dB) < 3,16 mV
 KW (S/R = 20 dB) < 20 μ V

Sensitivity:
 FM (S/N = 30 dB) < 15.9 μ V
 MW (S/N = 20 dB) < 1.26 mV
 LW (S/N = 20 dB) < 3.16 mV
 SW (S/N = 20 dB) < 20 μ V

Zwischenfrequenzen:
 FM 10,7 MHz
 AM 55845 kHz und 450 kHz

Intermediate frequencies:
 FM 10.7 MHz
 AM 55845 kHz and 450 kHz

AM-ZF Frequenzgangumschaltung (450 kHz) für Nah- und Fernempfang

AM-IF frequency response – switching for wide and narrow stations

Verstärker

Max. Ausgangsleistung: 1,2 W

Amplifier

Max. power output: 1.2 W

Anschlüsse

Buchse	Eingang/ Ausgang/ Typ	Impedanz	Pegel
TB	DIN/A	(1 kHz)* (200 Ω /600 Ω)	1 mV
Kopfhörer	\emptyset 3,5/A	—	—
AM-Antenne	\emptyset 3,5/E	—	9 V/400 mA
Netz			

* Abschlußimpedanz

Connection

Socket	Input/ Output/ Type	Impedance	Level
TB	DIN/O	(1 kHz)* (200 Ω /600 Ω)	1 mV
Phones	\emptyset 3.5/O	—	—
AM-Antenna	\emptyset 3.5/I	—	9 V/400 mA
Power supply.			

* Terminal impedance

Reparaturhinweise/Repair hints

Wenn bei einem Defekt die Ersatzteile A eingebaut werden,
so müssen die Bauelemente B die folgenden Werte haben:

If remove spare positions to spares A, the elements B
must have the following values:

Position	Ersatzteil A/Spares A	Position	Bauelemente B/Elements B
CF 103	SFA 10,7 MF5K	C 33 R 31 R 33	3 pF (CK) 470 Ω 680 Ω
IC 101	μ PC 1018C	R 19 R 20	560 Ω —
IC 201	LA 3361	R 28 R 229 R 238	12 k Ω 18 k Ω 18 k Ω
D 130	FC 52 M-5	R 134	330 k Ω
D 204	KB 162	R 215	100 k Ω
X 402	32,768 MHz	C 415	15 pF (CH)
Q 110	2SK 152-2	R 71	220 Ω
Q 110/ Q 115/ Q 117/ Q 118	2SK 152	R 87	47 k Ω

Abgleichtabelle A

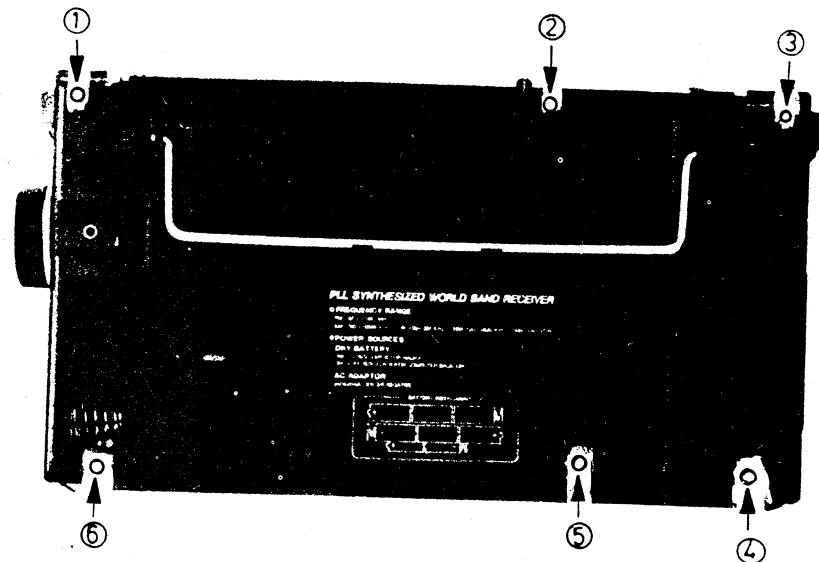
Schritt	Funktion	Vorbereitung	Signaleingang	Einstell-element	Meßwert
1.	Versorgungsspannung Bild 1	Die Ein-/Ausschalttaste (POWER) ausschalten. Gleichspannungs-Netzgerät an die Anschlußpunkte A und B anschließen. Digitalvoltmeter an den Kollektor von Transistor Q 207 und Masse anschließen.	12 V	VR 202	3 V ± 0,05 V
2.	Uhrentakt/ Referenzfrequenz Bild 2	Die Ein-/Ausschalttaste (POWER) ausschalten. Frequenzähler über 470 kΩ Widerstand an IC 402, Pin 20 und 21 anschließen. Die Spannungsversorgung des Gerätes sicherstellen.	-	VT 402	32,768 kHz
3.	FM-Oszillator/ 1. AM-Oszillator Bild 3	Die Ein-/Ausschalttaste (POWER) einschalten. Digitalvoltmeter (10 M) an Q 130, Gate und Masse anschließen. RK 651-Display auf 108 MHz stellen. Stand I: D 103 = FC-52M5 R 134 = 330 kΩ Stand II: D 103 = FC-52M6 R 134 = 390 kΩ	-	L 117	9,35 ± 0,15 V
4.	PLL-Referenz- oszillator Bild 4	Die Ein-/Ausschalttaste (POWER) einschalten. LCD auf 108 MHz stellen. Den Frequenzzähler an den Kollektor von Q 129 und Masse anschließen. (Massepunkt so nahe wie möglich am Kollektor.)	-	VT 401	118,7 + 0,0003 MHz
5.	2. AM-Oszillator Bild 4	Die Ein-/Ausschalttaste (POWER) einschalten; AM-Band wählen; Frequenzzähler an Q 120, Source und Masse anschließen. Den BFO-Schalter ausschalten.	-	T 111	55,397 - 0,001 MHz
6.	2. AM-ZF Bild 5 Abgleich mehrmals wiederholen	Die Ein-/Ausschalttaste (POWER) einschalten. AM-Band wählen. Wobbelgenerator über 0,01 µF Kondensator an Q 120 (Source) und Masse anschließen. Das Oszilloskop über 10 µF-Kondensator an TP 1 (C 46/R 30) und Masse anschließen.	Wobble at 450 kHz	T 112/ T 105	Maximum

Alignment table A

Step	Function	Preparation	Signal input	Adjusting element	Indicated value
1.	Supply voltage Figure 1	Set power switch to off-position. Connect DC-constanter to points A and B. Connect digital voltmeter (10 M) to collector of transistor Q 207 and ground.	12 V	VR 202	3 V ± 0.05 V
2.	Clock time accuracy Figure 2	Set power switch to off-position. Connect frequency counter via 470 kΩ-resistor to IC 402, pin 20 and pin 21. Set with correct main supply.	-	VT 402	32.768 kHz
3.	FM-Oscillator/ 1. AM-Oscillator Figure 3	Set power switch to on position. Connect digital voltmeter (10 M) to Q 130, gate and ground. Set RK 651-display to 108 MHz. Type I: D 103 = FC-52M5 R 134 = 330 kΩ Type II: D 103 = FC-52M6 R 134 = 390 kΩ	-	L 117	9.35 ± 0.15 V
4.	PLL-Reference oscillator Figure 4	Set power switch to on-position. Set LCD to 108 MHz. Connect frequency counter to collector of Q 129 and ground. (Ground point as near as possible at collector.)	-	VT 401	118.7 + 0.0003 MHz
5.	2. AM-Oscillator Figure 4	Set power switch to on-position. Switch to AM-band. Connect frequency counter to Q 120, source and ground. Set BFO-switch to off-position.	-	T 111	55.397 - 0.001 MHz
6.	2. AM-ZF Figure 5 Repeat adjustment several times	Set power switch to on-position. Switch to AM-band. Connect sweep-generator via 0.01 µF capacitor to Q 120 (source) and ground. Connect oscilloscope via 10 µF capacitor to TP 1 (C 46/R 30) and ground.	Wobble at 450 kHz	T 112/ T 105	Maximum

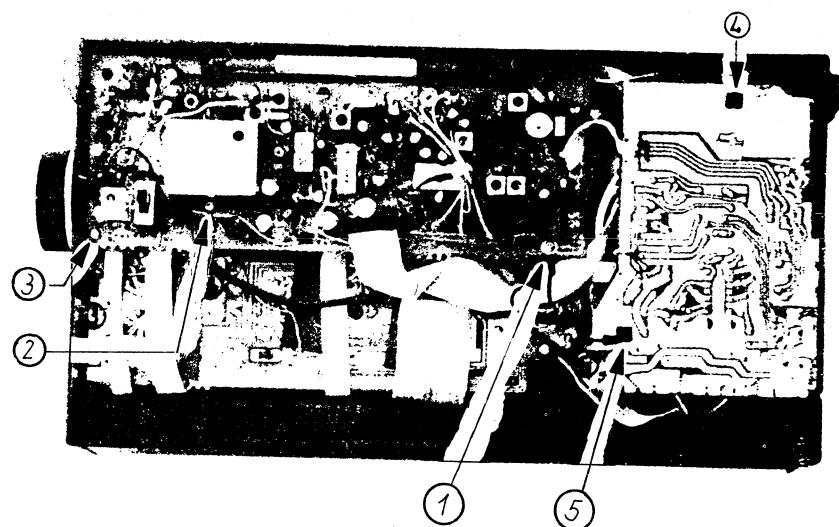
Rückwand/Back cover

6 Schrauben berücksichtigen/
Have regard to 6 screws
(2.6 × 12)



**Tunerplatine/A-1-p.c.b. (A)
NF/DC-Platine/B-p.c.b. (B)**

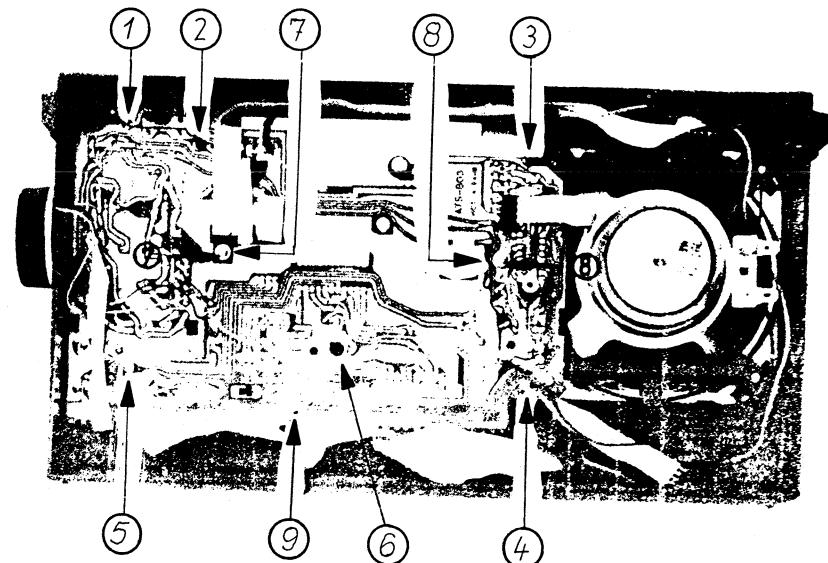
- (A) 3 Schrauben berücksichtigen/
Have regard to 3 screws
① 2.6 × 8 ② ③ 2.6 × 4
- (B) 2 Rasthaken berücksichtigen/
Have regard to 2 hooks



**Klangregel- und Schaltplatine/A-2-p.c.b.
PLL+Tastenfeldplatine/C-p.c.b.**

9 Schrauben berücksichtigen/
Have regard to 9 screws

- ① ... ⑥ 2.6 × 8
- ⑦ ... ⑨ 2.6 × 4



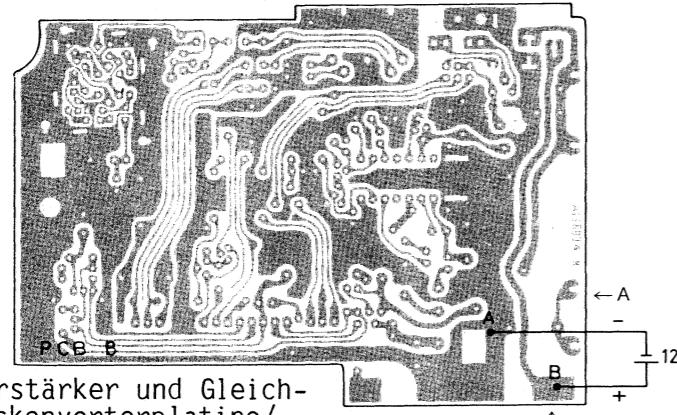
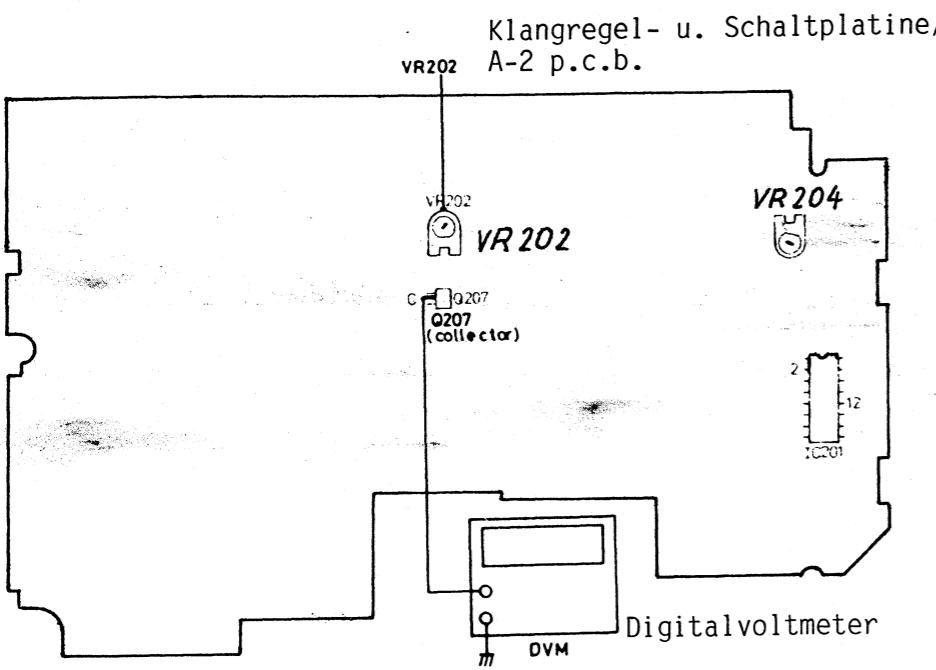


Bild 1/Figure 1

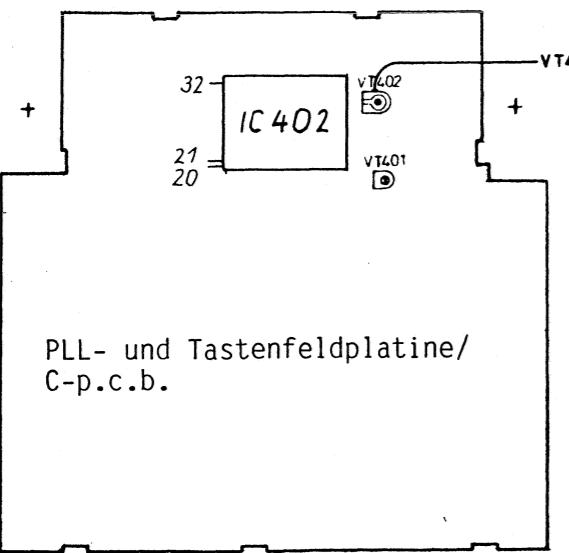


Bild 2/Figure 2

5

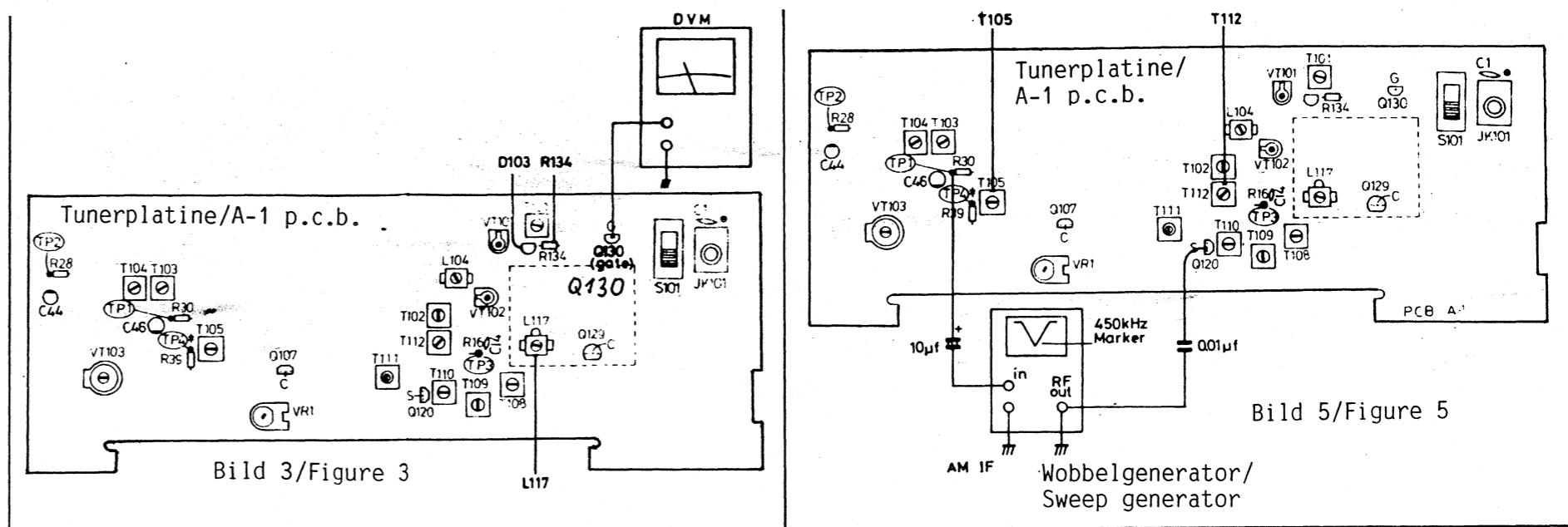


Bild 3/Figure 3

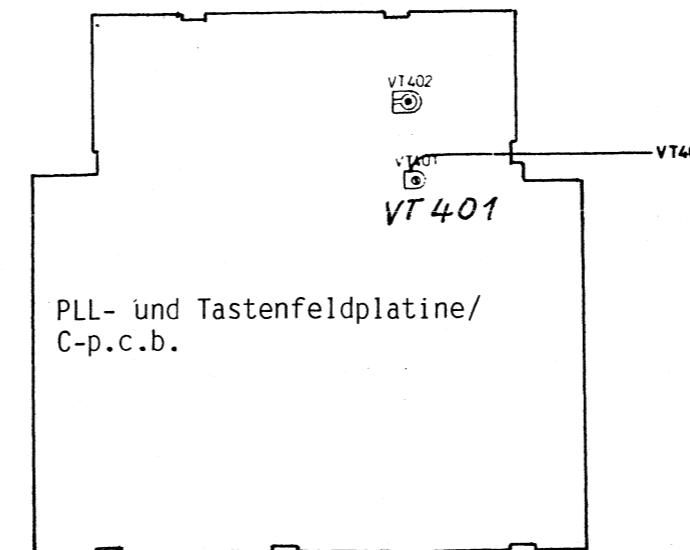
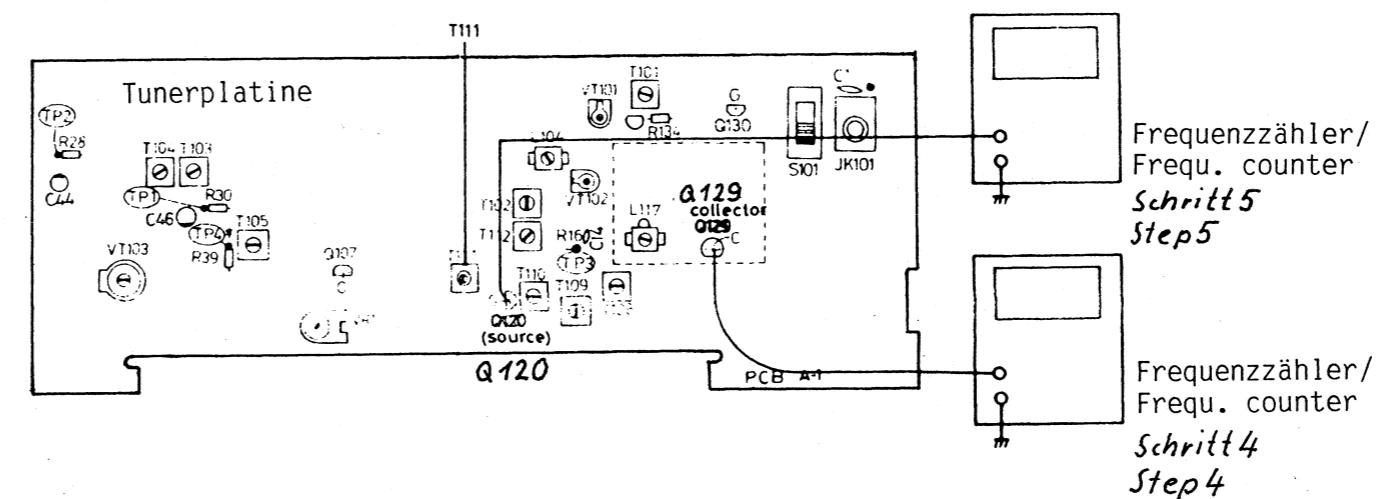
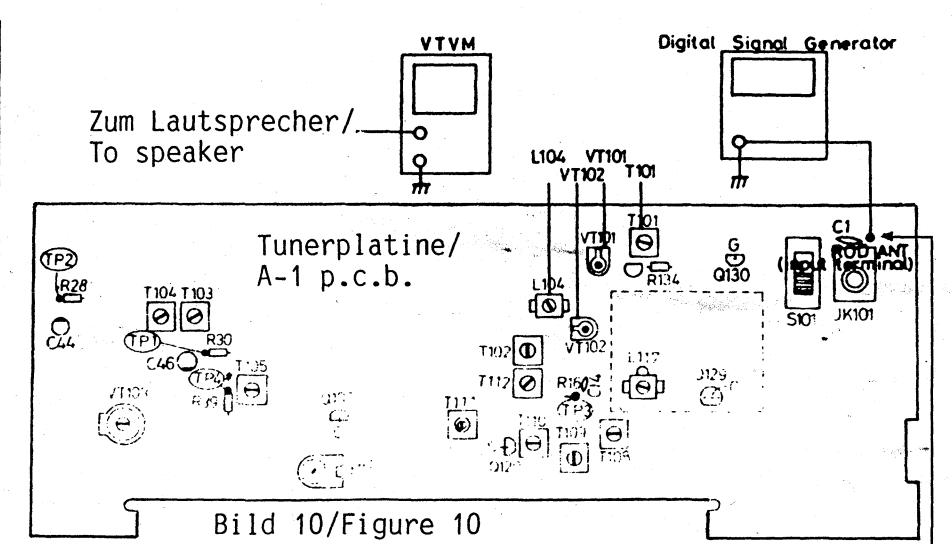
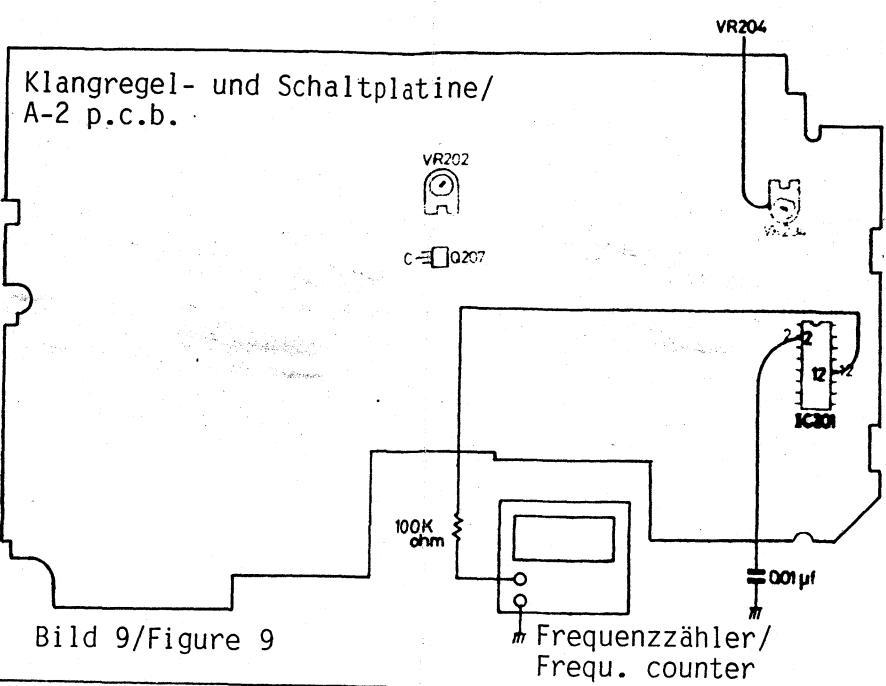
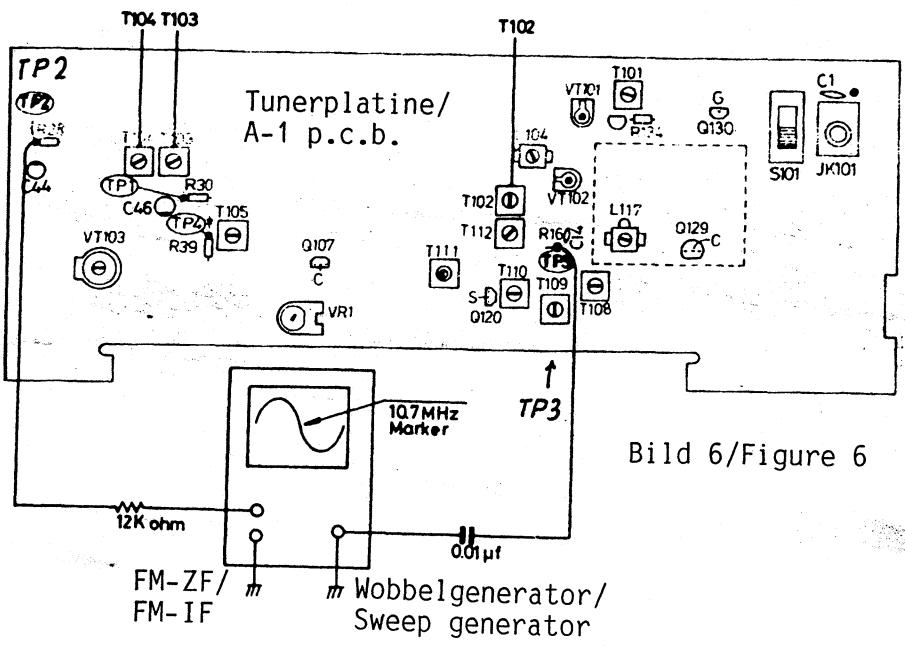
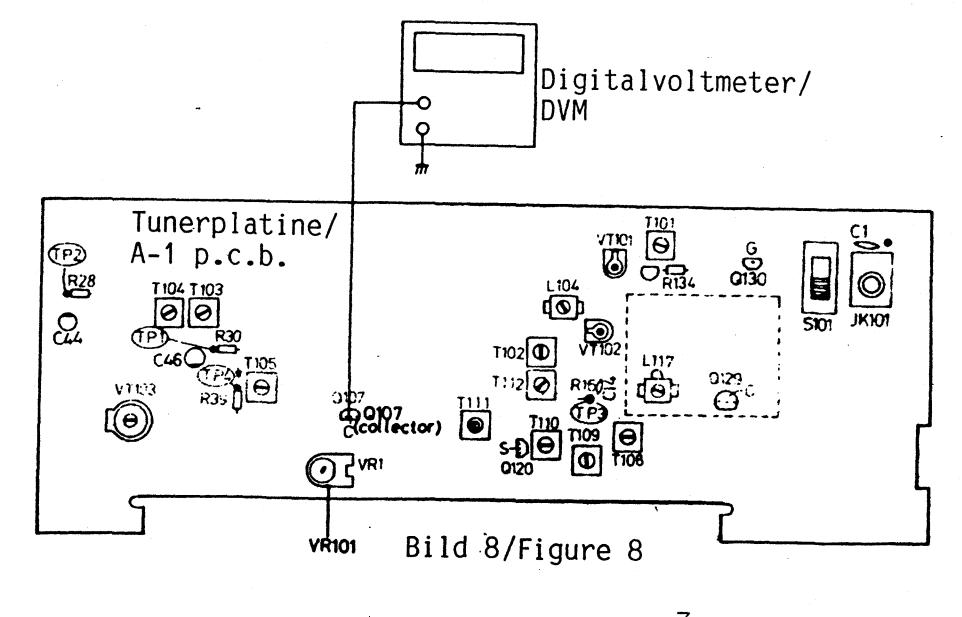
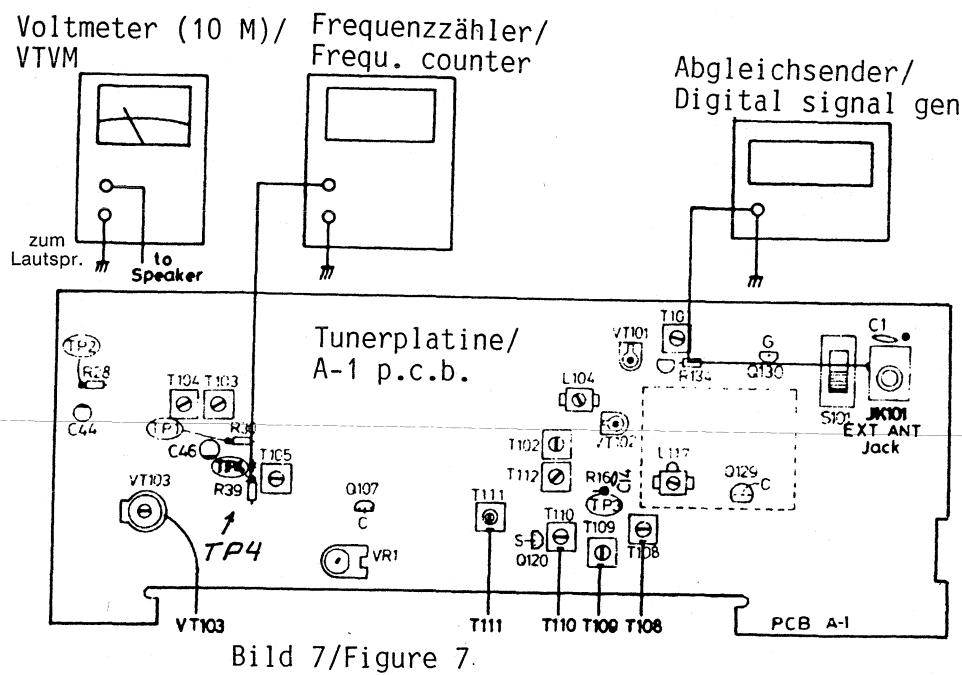


Bild 4/Figure 4



Teleskop-
antennen-
anschluß



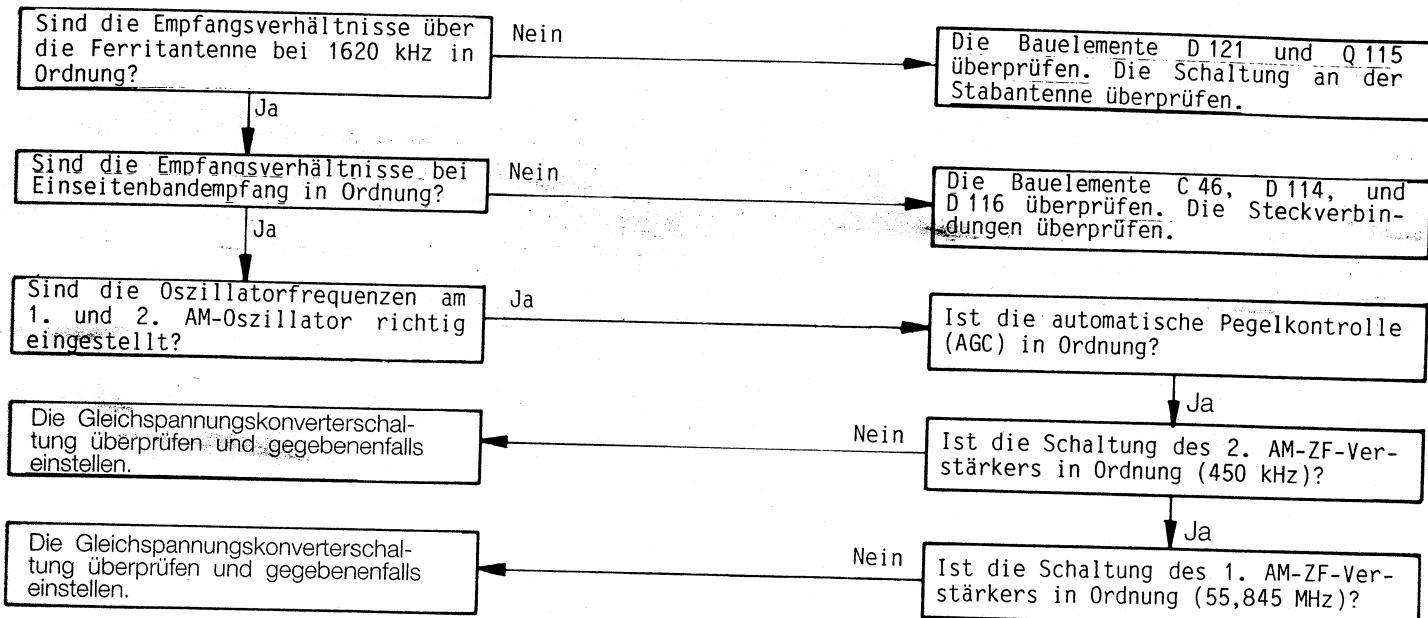
Fortsetzung des Abgleichs Abgleichtabelle B

Schritt	Funktion	Vorbereitung	Signaleingang	Einstell-element	Meßwert
7.	FM-ZF/Diskriminator Abgleich mehrmals wiederholen Bild 6	Die Ein-/Ausschalttaste (POWER) auf "ein" stellen. Den Wobbelgenerator über 0,01 μF Kondensator an TP 3 (C 14/R 16) und Masse anschließen. Oszilloskop über 12 kΩ - Widerstand an TP 2 (R 28/C 44) und Masse anschließen.	Um 10,7 MHz wobbeln	T 102/T 103/ T 104	Max. symmetrische "S-Kurve" mit 0-Durchgang bei $10,7 \pm 0,1$ MHz
8.	AM-Vorselektion Bild 7	Die Ein-/Ausschalttaste (POWER) auf "ein" stellen. KW-Band einschalten. BFO-Schalter ausschalten. Antennenschalter auf "Ext" (ein) stellen. Abgleichsender an die Antennenbuchse anschließen. Voltmeter parallel zum Lautsprecher anschließen.	LCD-Frequenz/ 30 %/1 kHz	T 108/T 109/ T 110	Max. 1 kHz-Pegel
9.	AM-ZF-Feineinstellung Bild 7	Frequenzzähler an TP 4 (R 38/D 107) und Masse einstellen.	-	T 111	450 kHz $\pm 0,2$ kHz
10.	BFO, Einseitenband Bild 7	BFO-Schalter einschalten. Den BFO-Knopf unbedingt auf Mittelposition stellen.	LCD-Frequenz ohne Modulation	VT 103	Min. am Voltmeter
11.	Feldstärke und Stop-Pegelleinstellung Bild 8	Die Ein-/Ausschalttaste (POWER) auf "ein" stellen. AM-Band einschalten. Den BFO-Schalter auf "aus" schalten. Das RK 651-LCD auf 29999 kHz stellen. Digitalvoltmeter (10 M) an den Kollektor von Q 107 und Masse anschließen.	-	VR 101	$2 \pm 0,05$ V
12.	FM-Pilotton Bild 9	Die Ein-/Ausschalttaste (POWER) auf "ein" stellen. Den "FM-mode"-Schalter auf "Stereo" stellen. Einen 0,01 μF-Kondensator von IC 201, Pin 2 nach Masse schalten. Den Frequenzzähler über 100 k -Widerstand an IC 201, Pin 12 und Masse anschließen. UKW-Band einstellen; beliebige Frequenz (LCD)	-	VR 204	19 kHz
13.	UKW-Vorselektion Abgleich mehrmals wiederholen Bild 10	Die Ein-/Ausschalttaste (POWER) auf "ein" stellen. Voltmeter (10 M) parallel zum Lautsprecher anschließen. Abgleichsender am Stabantennenfußpunkt und Masse anschließen. HF-Antennenabschwächer (RF-gain) auf Rechtsanschlag (Maximum) stellen. RK 651-LCD auf 90 MHz stellen. RK 651-LCD auf 106 MHz stellen.	90 MHz/22,5 kHz/1 kHz 106 MHz/22,5 kHz/1 kHz	L 104/T 101 VT 102/VT 101	Max. 1 kHz-Pegel Max. 1 kHz-Pegel

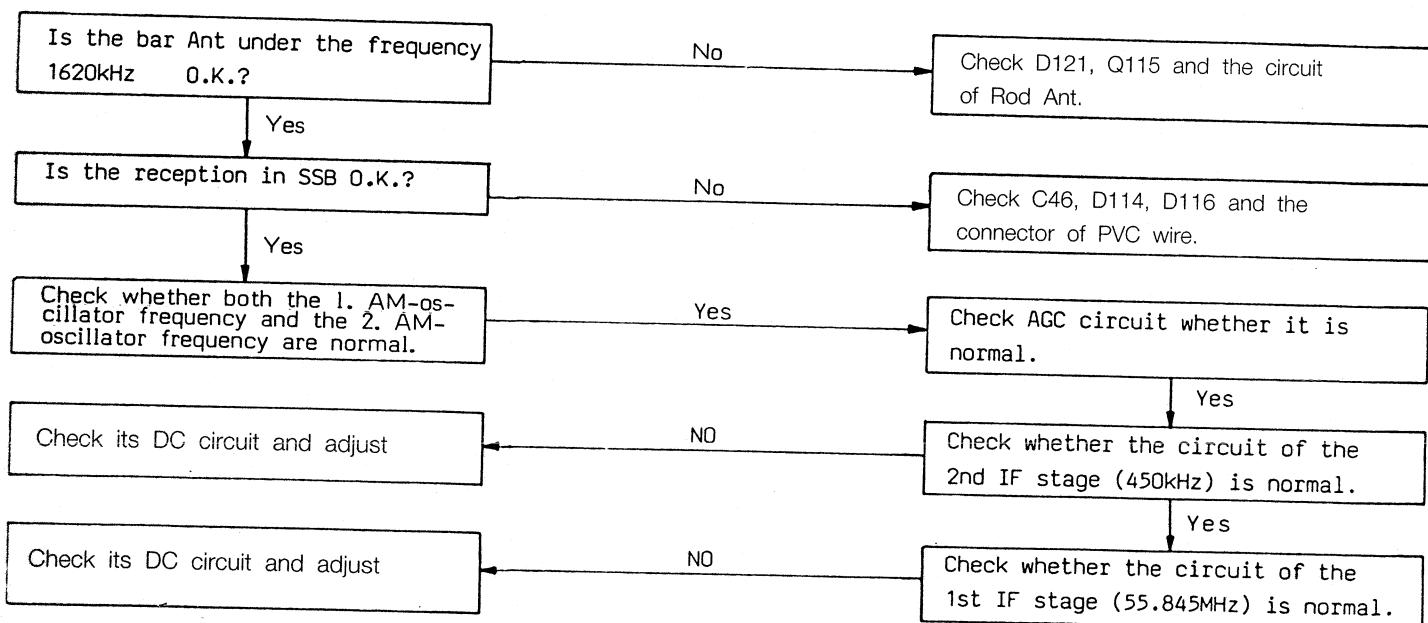
Alignment table B

Step	Function	Preparation	Signal input	Adjusting element	Indicated value
7.	FM-IF/Discriminator Repeat adjustment several times Figure 6	Set power switch to on position. Connect sweep generator via 0.01 μ F capacitor to TP 3 (C 14/R 16) and ground. Connect oscilloscope via 12 k Ω -resistor to TP 2 (R 28/C 44) and ground.	Wobble at 10.7 MHz	T 102/T 103/ T 104	Max. symmetrical "S-curve" with zero axis across at 10.7 ± 0.1 MHz
8.	AM-Tracking Figure 7 Repeat adjustment several times	Set power switch to on-position. Switch to SW band. Set BFO-switch to off-position. Set antenna switch to "Ext-position" (on). Connect RF-generator to antenna socket. Connect voltmeter (10 M) across speaker.	LDC-frequency/ 30 %/1 kHz	T 108/T 109/ T 110	Max. 1 kHz-level
9.	AM-IF-Fine adjustment Figure 7	Connect frequency counter to TP 4 (R 38/D 107) and ground.		T 111	450 kHz \pm 0.2 kHz
10.	BFO, Single Side-band Figure 7	Set BFO-switch to on-position. Turn BFO-pitch control knob absolute to middle position.	LCD-frequency without modulation	VT 103	Min. on voltmeter
11.	Signal level and stop level Figure 8	Set power switch to on-position. Switch to AM-band. Set BFO-switch to off-position. Set RK 651-LCD to 29999 kHz. Connect digital voltmeter (10 M) to collector of Q 107 and ground.	-	VR 101	2 \pm 0.05 V
12.	FM-Pilot Figure 9	Set power switch to on-position. Set FM-mode switch to stereo position. Solder additional 0.01 μ F-capacitor from IC 201, pin 2 to ground. Connect frequency counter via 100 k -resistor to IC 201, pin 12 and ground. Switch to FM-band. Any LCD-frequency.	-	VR 204	19 kHz
13.	FM-Tracking Repeat adjustment several times Figure 10	Set power switch to on-position. Set voltmeter (10 M) across speaker. Connect RF-generator to rod antenna terminal and ground. Turn RF-gain knob to right stop (Maximum). Set RK 651-LCD to 90 MHz. Set RK 651-LCD to 106 MHz.	90 MHz/22.5 kHz/1 kHz 106 MHz/22.5 kHz/1 kHz	L 104/T 101 VT 102/VT 101	Max. 1 kHz-level Max. 1 kHz-level

Schwache Empfindlichkeit im AM-Band

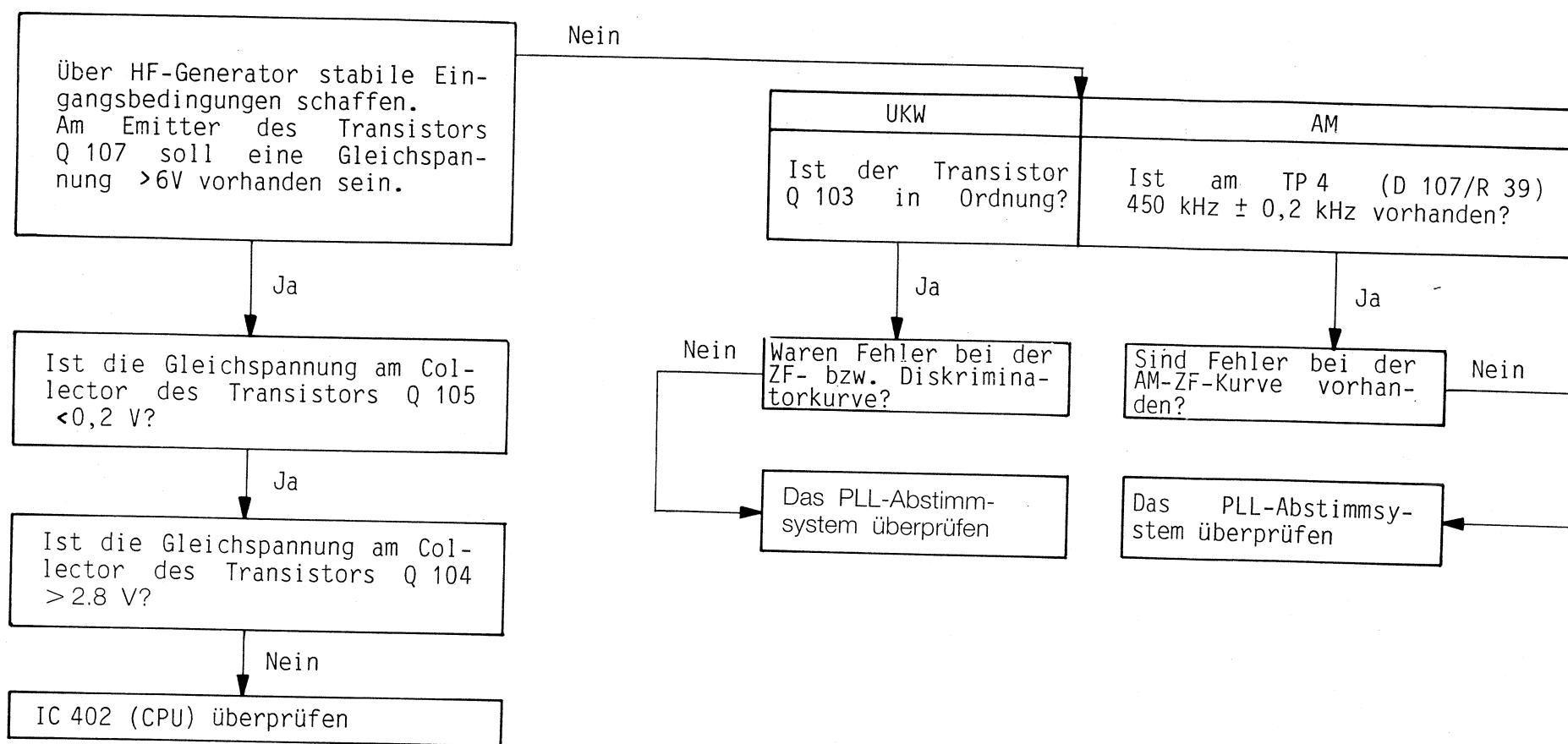


Weak sensitivity in AM-band

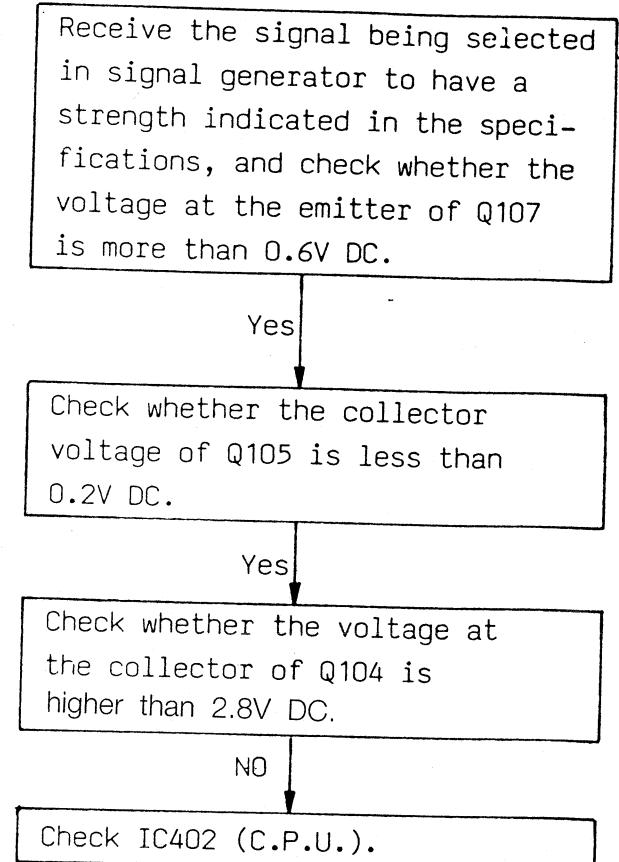


Fehlersuchdiagramm/Trouble shooting flow chart

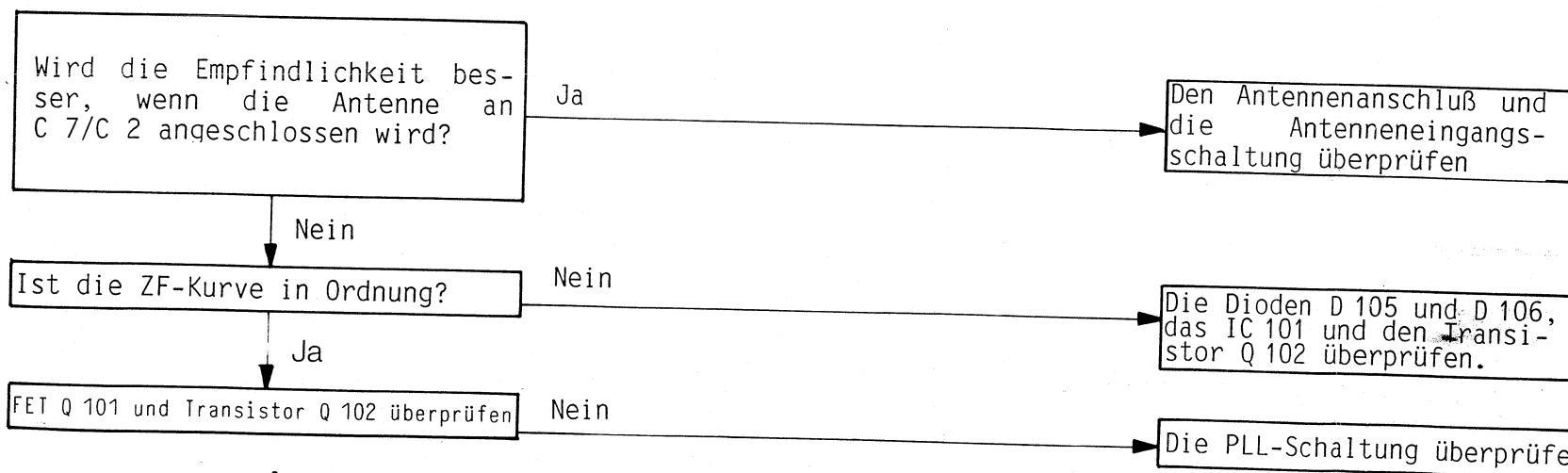
Kein Stop bei automatischem Sendersuchlauf!



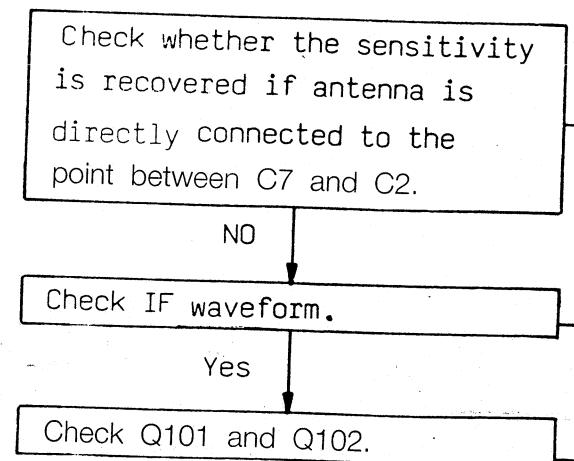
Scan Auto Stop does not work



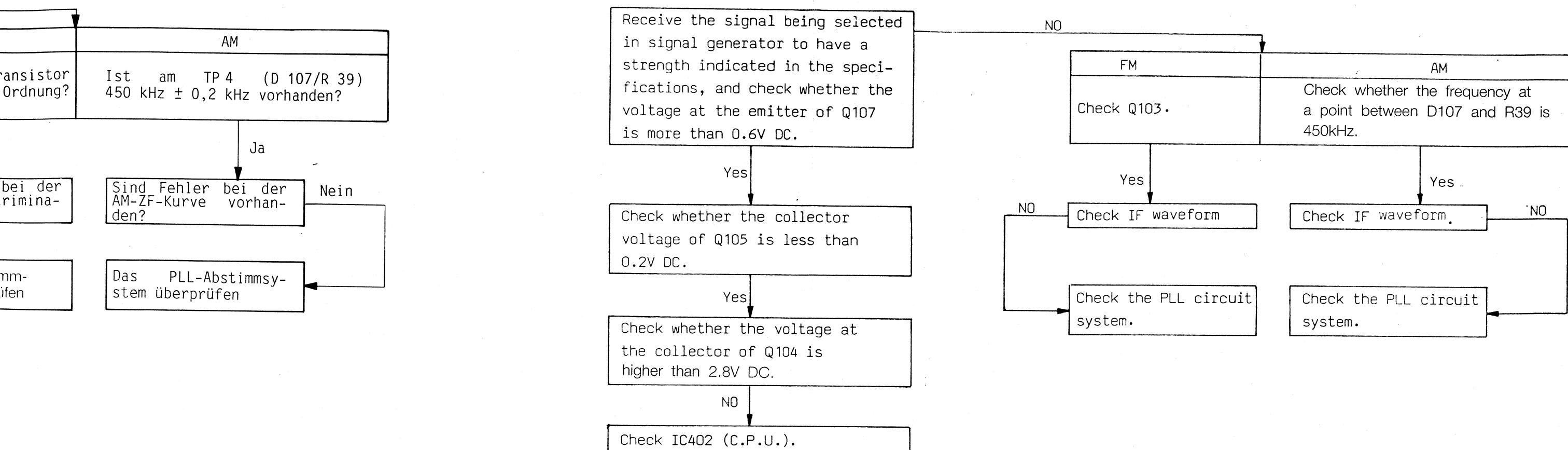
Schwache UKW-Empfindlichkeit



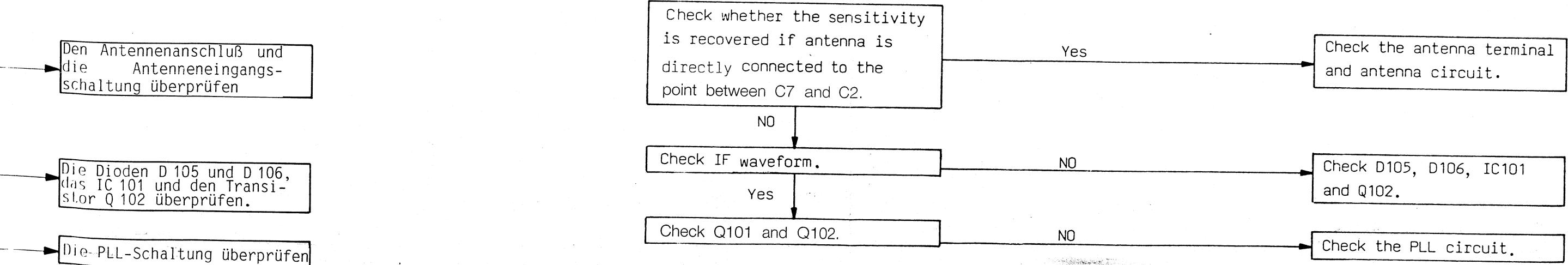
Weak sensitivity on FM mode



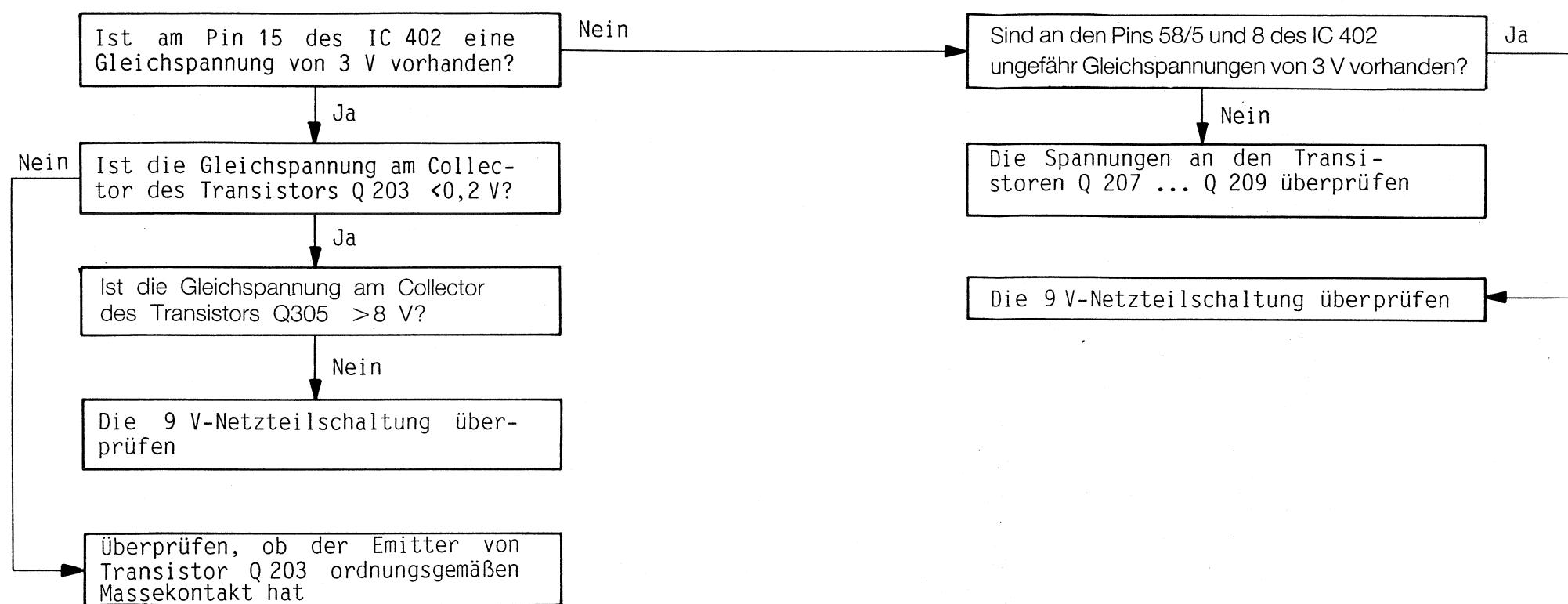
Scan Auto Stop does not work



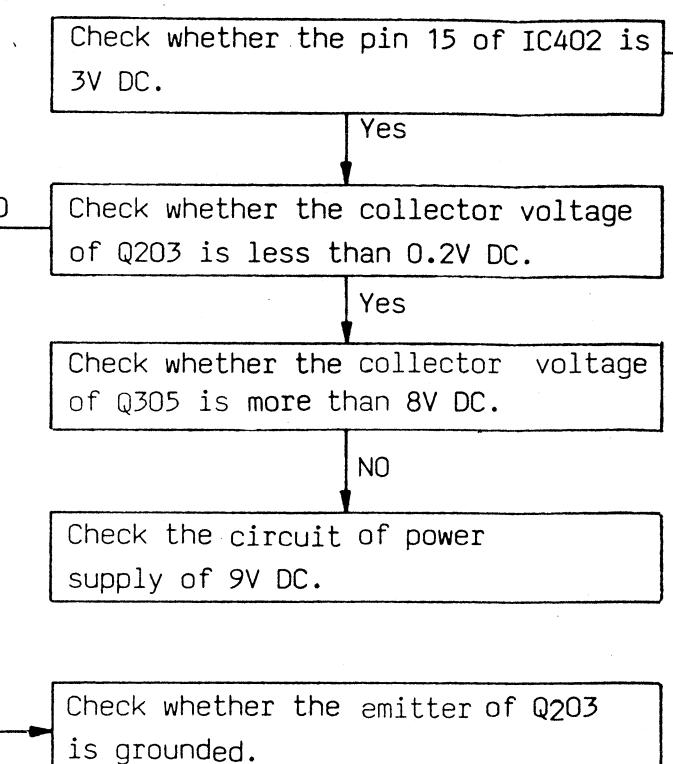
Weak sensitivity on FM mode



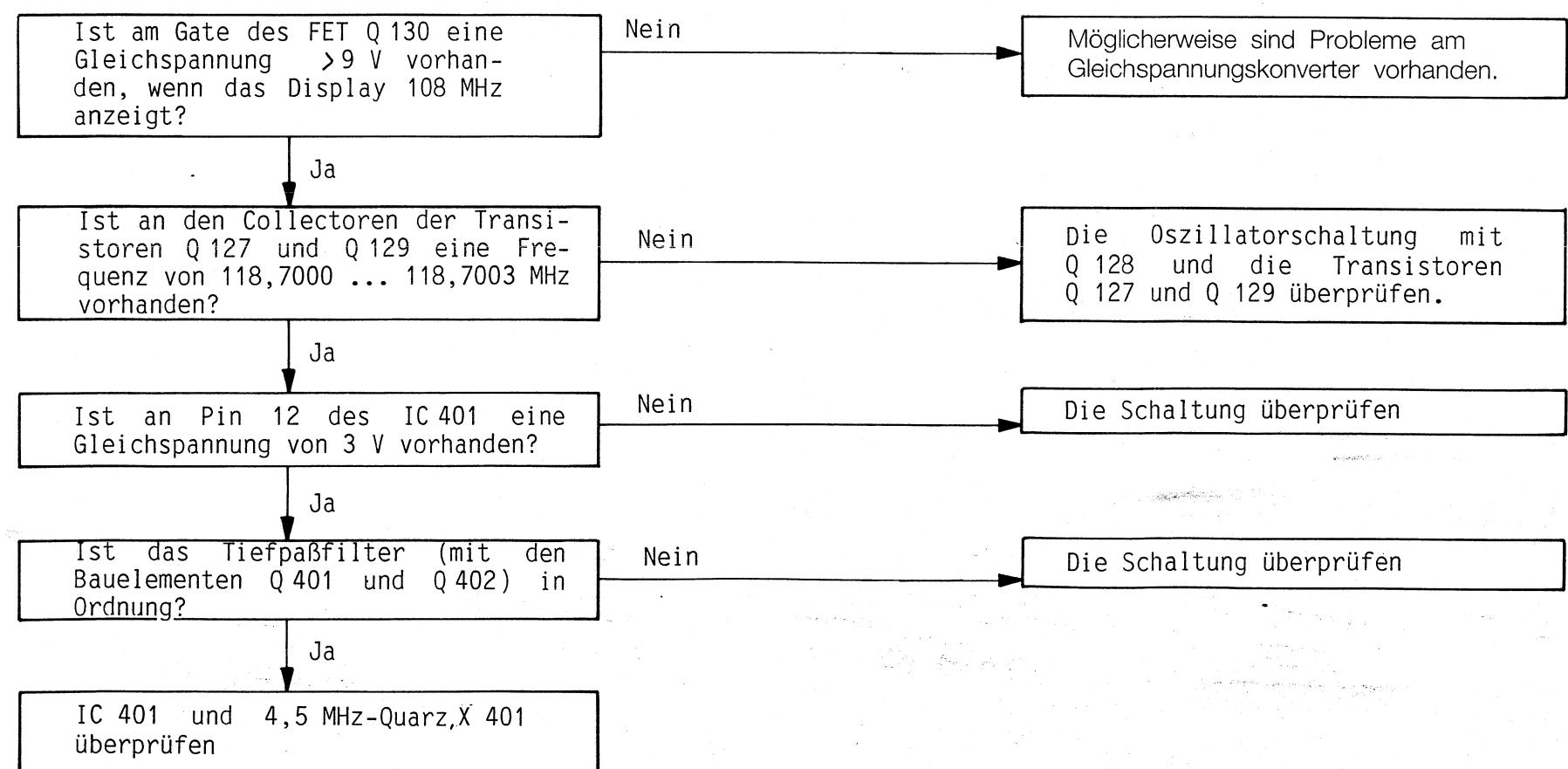
Das Gerät kann über die Ein-/Ausschalttaste (POWER) nicht eingeschaltet werden.



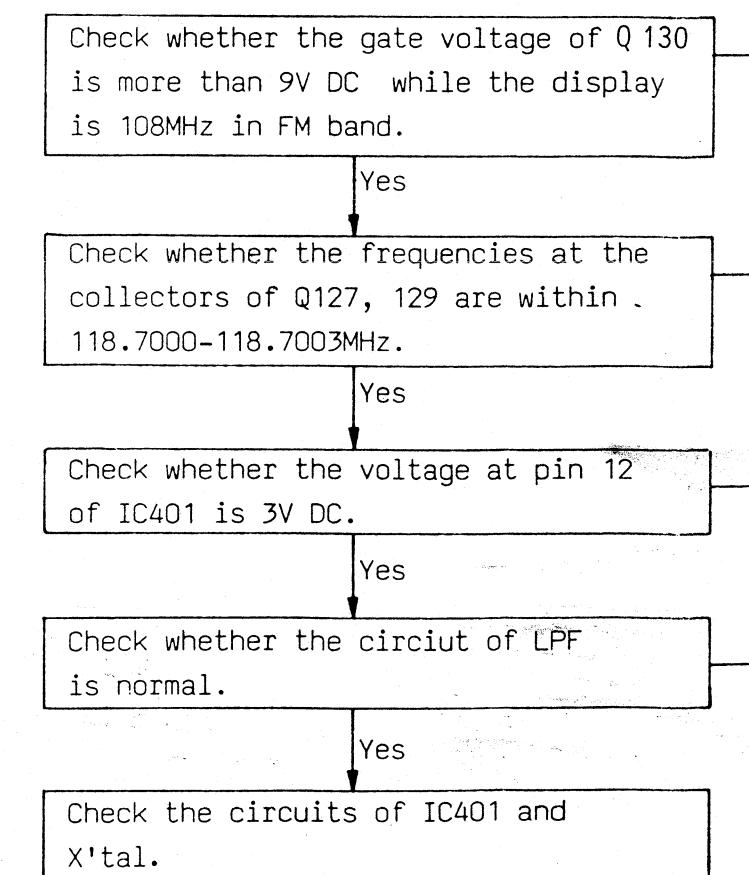
Power can not be turned on



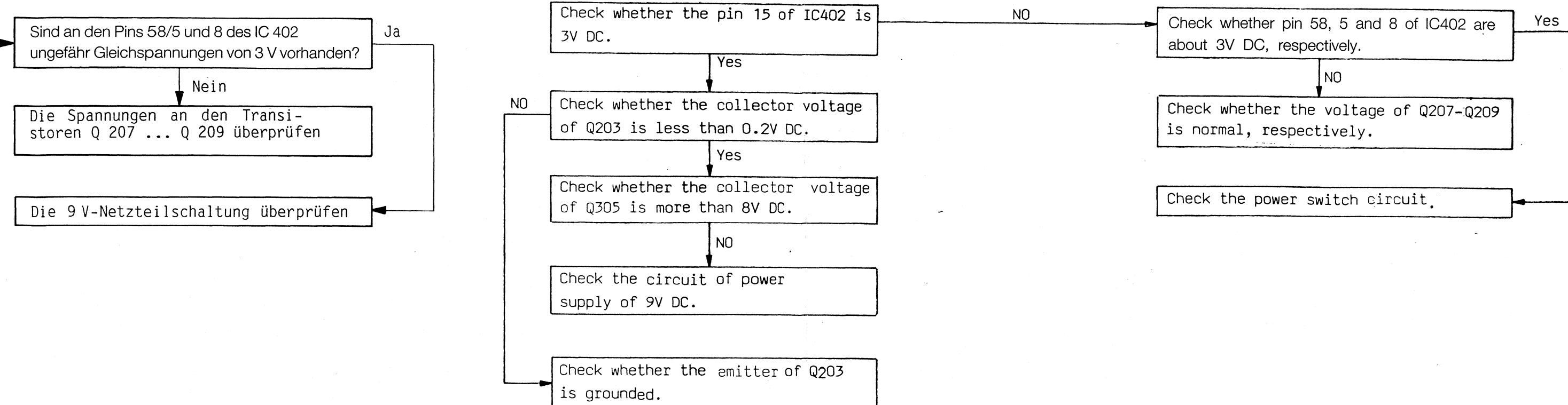
Die Abstimmung (PLL) funktioniert nicht



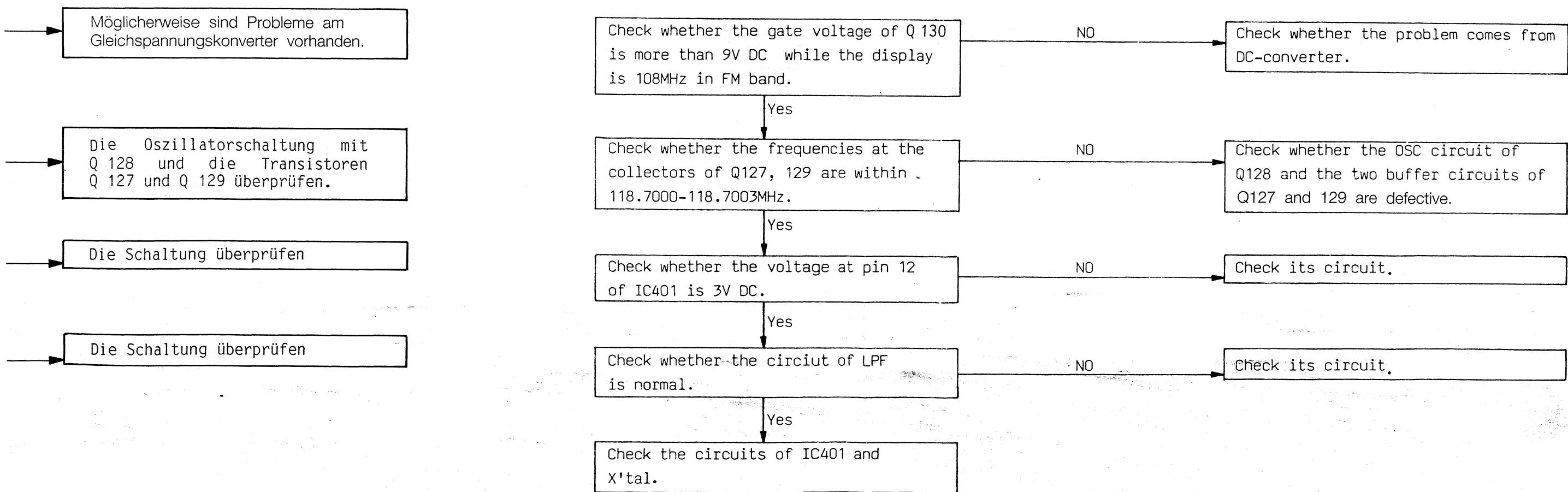
PLL does not work



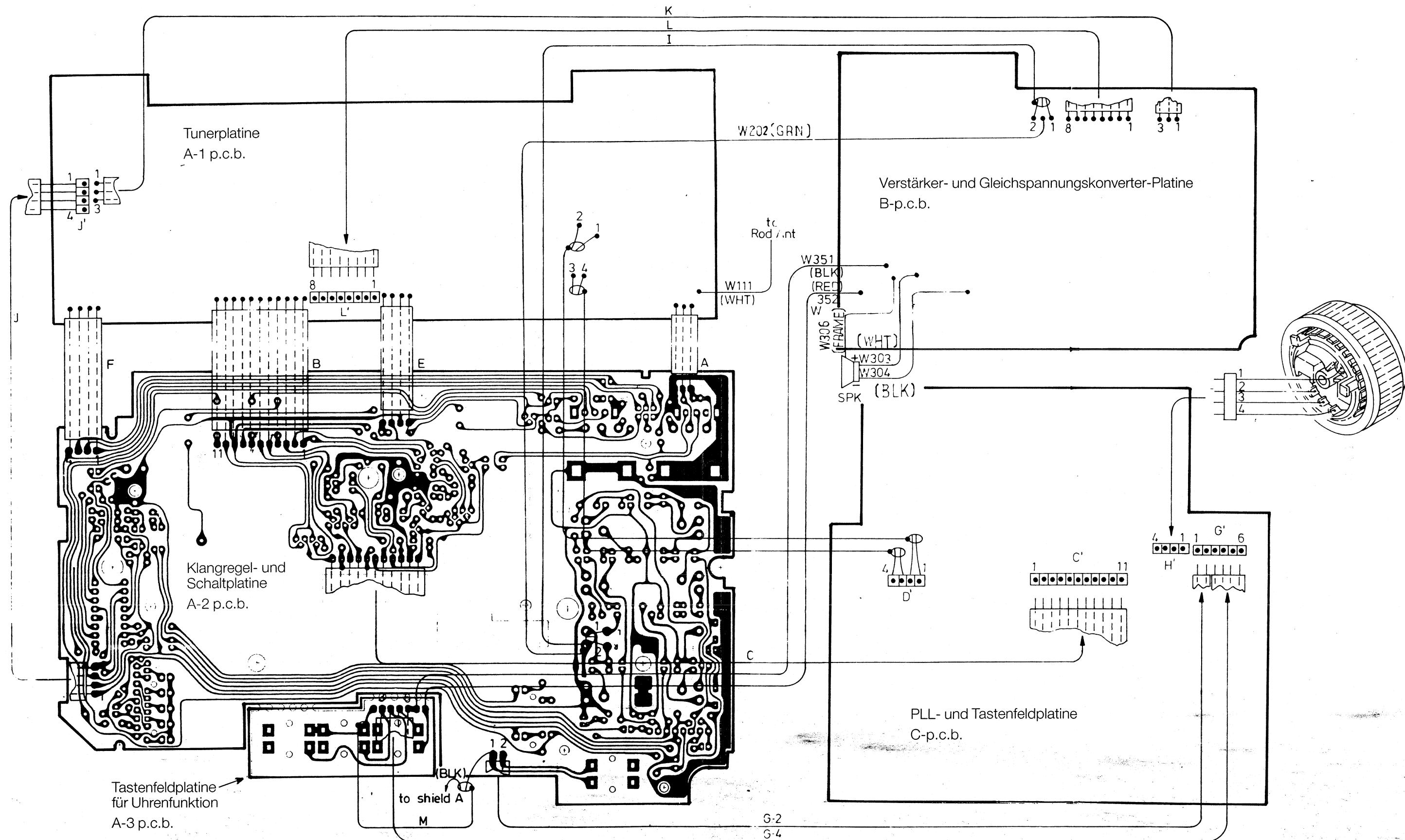
Power can not be turned on

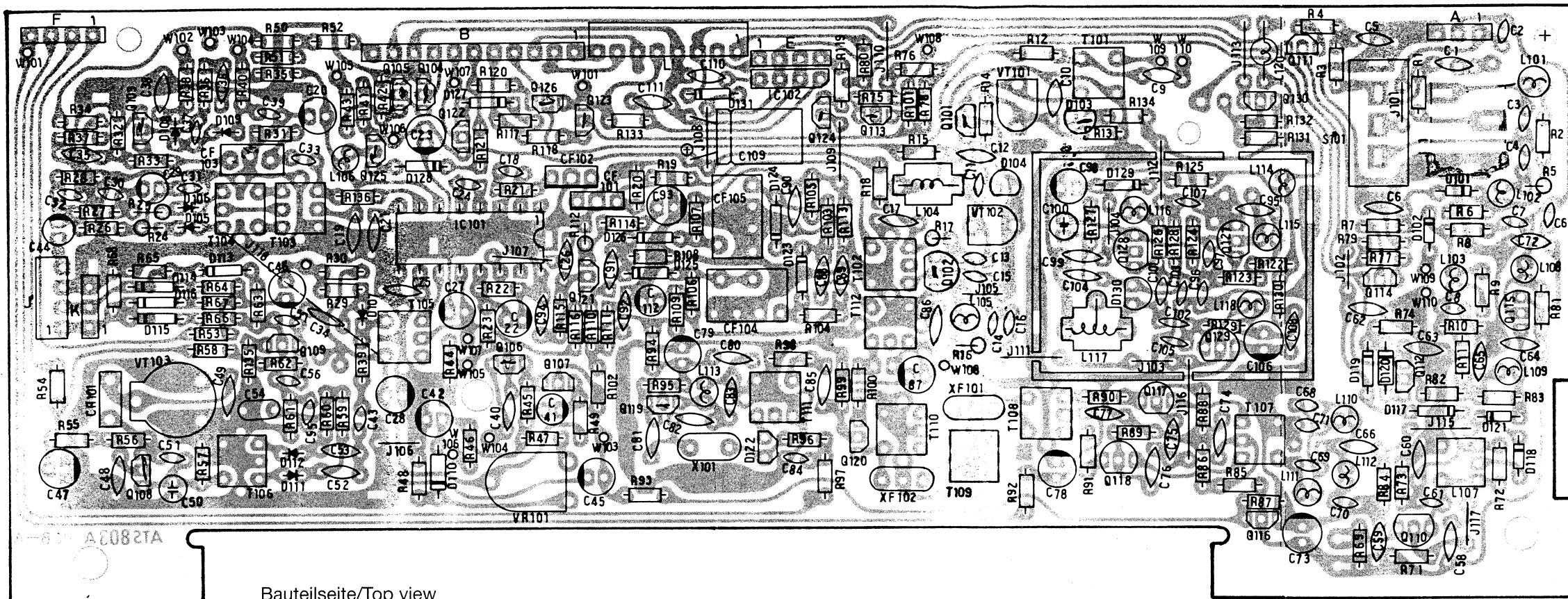


PLL does not work

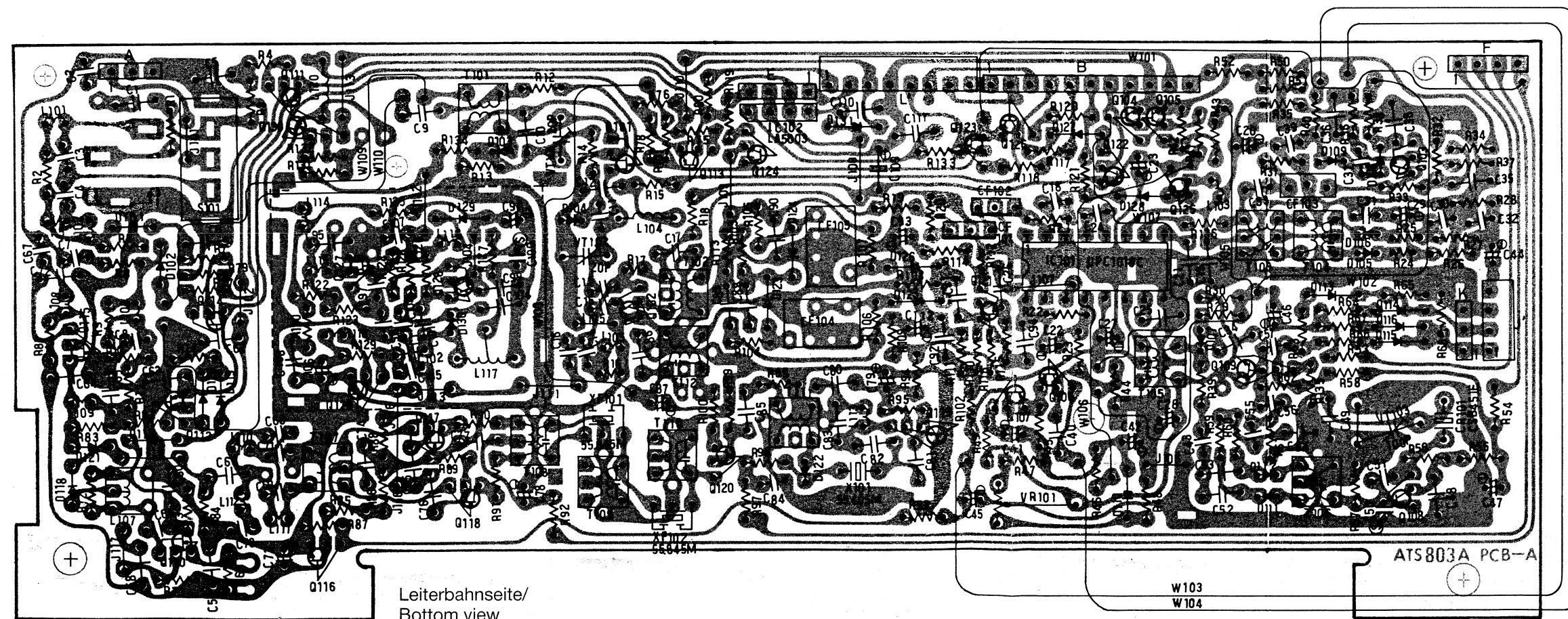


Verdrahtungsplan
Wiring diagram





Bauteilseite/Top view

Leiterbahnseite/
Bottom viewIntegrierte Schaltung/
Integrated circuit

Typ	PIN	FM	AM	SSB/CW
IC101	1	0.09	1.75	1.75
	2	0.71	0.04	0.04
	3	0.0	0.0	0.0
	4	1.45	0.07	0.07
	5	1.85	0	0
	6	2.96	0.02	0.02
	7	2.48	0.02	0.02
	8	1.85	0	0
	9	0.01	0.01	0.01
	10	0.01	0.75	0.75
	11	0.06	2.96	2.96
	12	0.06	2.96	2.96
	13	0.31	0.31	0.31
	14	0.01	0.71	0.71
	15	0.09	2.18	2.18
	16	0.0	0.0	0.0
IC102	1	6.74	6.89	6.9
	2	0	0	0
	3	3.07	3.07	3.07
	4	6.09	6.24	6.24

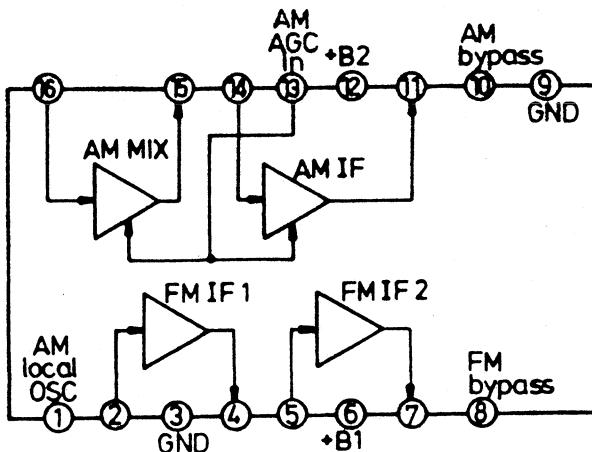
Transistor

Typ	Anschl.	FM	AM	SSB/CW
Q101	G	0.01	0.01	0.01
	D	5.0	0.01	0.01
	S	0.0	0.0	0.0
Q102	B	0.7	0.7	0.7
	C	2.08	2.08	2.08
	E	0.0	0.0	0.0
Q103	B	0.92	0.64	0.64
	C	1.60	0.02	0.02
	E	0.23	0.0	0.0
Q104	B	0.66	0.66	0.66
	C	0.01	0.01	0.01
	E	0.0	0.0	0.0
Q105	B	0.49	0.50	0.49
	C	0.66	0.66	0.66
	E	0.0	0.0	0.0
Q106	B	2.00	2.00	2.01
	C	0.57	0.58	0.57
	E	2.58	2.58	2.58
Q107	B	1.96	1.96	1.97
	C	2.07	2.05	2.05
	E	2.58	2.58	2.58
Q108	B	0.05	0.51	0.5
	C	0.06	1.31	1.31
	E	0.0	0.0	0.0

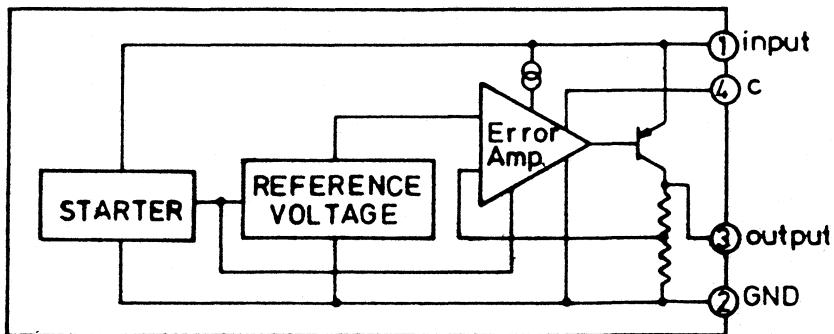
Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q109	B	0.05	0.72	0.72
	C	0.06	1.86	1.86
	E	0.0	0.012	0.012
Q110	G	0.04	1.04	0.11
	D	0.04	4.84	0.11
	S	0.04	0.87	0.11
Q111	B	0.01	5.18	0.34
	C	0	5.75	0.01
	E	0.01	5.84	0.38
Q112	B	0.07	5.35	5.26
	C	0.1	0.12	5.87
	E	0.01	5.92	5.93
Q113	B	0.07	5.26	5.82
	C	0.06	5.84	0.38
	E	0.01	5.92	5.93
Q114	B	0.01	5.75	5.32
	C	0	0	5.88
	E	0.01	5.92	5.94
Q115	G	0.04	0.11	0.11
	D	0.10	0.11	5.51
	S	0.09	0.11	1.06
Q116	B	0.62	0.68	0.68
	C	0.04	0.11	0.11
	E	0.0	0.0	0.0
Q117	G	0.03	0.08	0.07
	D	4.94	5.15	5.16
	S	1.18	1.15	1.15
Q118	G	0.03	0.08	0.07
	D	4.94	5.15	5.16
	S	1.18	1.15	1.15
Q119	B	0.06	0.68	0.68
	C	0.06	1.36	1.36
	E	0.0	0.01	0.01
Q120	G	0.01	0.01	0.01
	D	0.01	6.20	6.21
	S	0.01	1.04	1.04
Q121	B	0.64	0.91	0.91
	C	0.06	2.57	2.57
	E	0.05	0.32	0.32
Q122	B	3.69	2.37	2.37
	C	0.06	2.96	2.96
	E	3.07	3.07	3.07
Q123	B	6.29	6.32	6.34
	C	0.01	6.95	6.97
	E	6.86	7.01	7.03
Q124	B	0.01	6.32	6.33
	C	0.	6.94	6.95
	E	0.01	6.95	6.97
Q125	B	2.37	3.30	3.32
	C	2.97	0.02	0.02
	E	3.07	3.07	3.07

Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q126	B	6.15	6.45	6.46
	C	6.76	0.01	0.01
	E	6.86	7.01	7.03
Q127	B	0.75	0.75	0.75
	C	2.14	2.14	2.14
	E	0.0	0.0	0.0
Q128	B	1.42	1.43	1.43
	C	1.73	1.78	1.78
	E	0.76	0.74	0.74
Q129	B	0.75	0.75	0.75
	C	2.59	2.58	2.58
	E	0.0	0.0	0.0
Q130	G	(5.17)	(1.74)	(1.95)
	D	13.49	2.53	13.56
	S	(5.4)	(1.96)	(2.19)

IC101 - μPC1018C



IC102 - LA5003



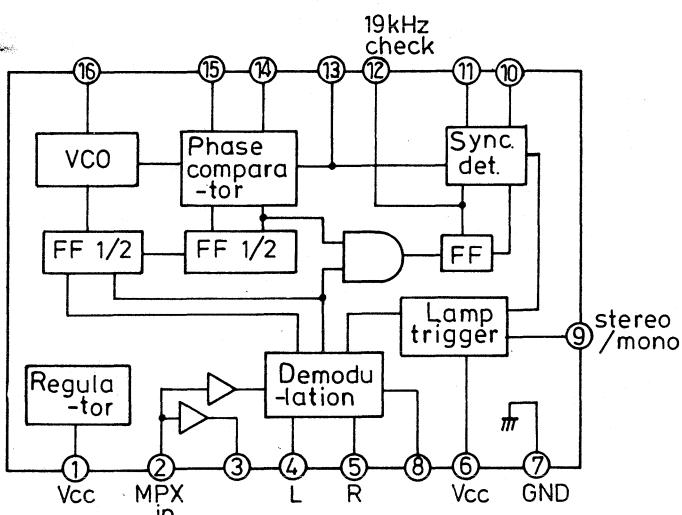
B-BASE C-COLLECTOR E-EMITTER ; G-GATE D-DRAIN S-SOURCE

Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q201	B	0.03	0.62	0.63
	C	0.03	0.09	0.09
	E	0.0	0.0	0.0
Q202	B	0	0.01	0.01
	C	0.01	6.43	6.44
	E	0	0.0	0.0
Q203	B	0	0.69	0.69
	C	8.71	0.15	0.15
	E	0	0.0	0.0
Q204	B	0.55	0.59	0.01
	C	0.01	0.06	5.84
	E	0.0	0.0	0.0
Q205	B	2.43	2.43	2.44
	C	3.04	3.05	3.06
	E	3.04	3.05	3.06
Q206	B	5.23	5.27	5.28
	C	3.04	3.05	3.06
	E	0	0.0	0.0
Q207	B	2.46	2.46	2.48
	C	3.04	3.05	3.06
	E	2.96	2.96	2.97
Q208	B	3.63	3.63	3.64
	C	7.24	7.3	7.31
	E	3.04	3.05	3.06
Q209	B	2.99	2.74	2.77
	C	0	0.0	0.0
	E	3.63	3.63	3.64
Q210	B	0.66	0.67	0.67
	C	0.01	0.02	0.02
	E	0.0	0.0	0.0

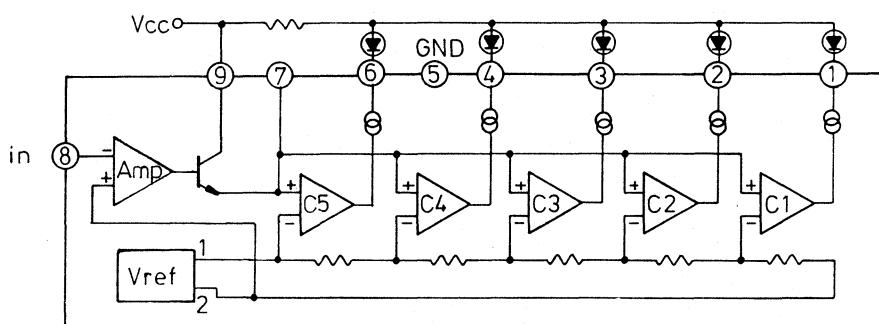
Typ	PIN	FM (V)	AM (V)	SSB/CW (V)
IC201	1	5.96	0.01	0.01
	2	2.36	0.01	0.02
	3	1.7	0.01	0.01
	4	1.76	0.01	0.01
	5	1.76	0.01	0.05
	6	5.37	5.54	5.52
	7	0.0	0.0	0.0
	8	0.49	0.01	0.01
	9	0.06	0.03	0.04
	10	1.36	0	0.04
	11	1.36	0	0
	12	1.02	0.01	0.01
	13	1.36	0	0
	14	1.36	0	0
	15	1.36	0	0.01
	16	0.82	0	0.01
IC202	1	5.33	5.33	5.33
	2	5.26	5.26	5.26
	3	5.25	5.25	5.25
	4	5.24	5.24	5.24
	5	0.0	0.0	0.0
	6	5.24	5.24	5.24
	7	1.43	1.43	1.43
	8	1.44	1.44	1.44
	9	6.67	6.67	6.67

Typ	PIN	FM (V)	AM (V)	SSB/CW (V)
IC203	1	1.24	1.24	1.24
	2	0.71	0.71	0.71
	3	2.63	2.64	2.64
	4	6.53	6.53	6.53
	5	0.0	0.0	0.0
	6	2.56	2.57	2.57
	7	0.71	0.71	0.71
	8	1.24	1.24	1.24

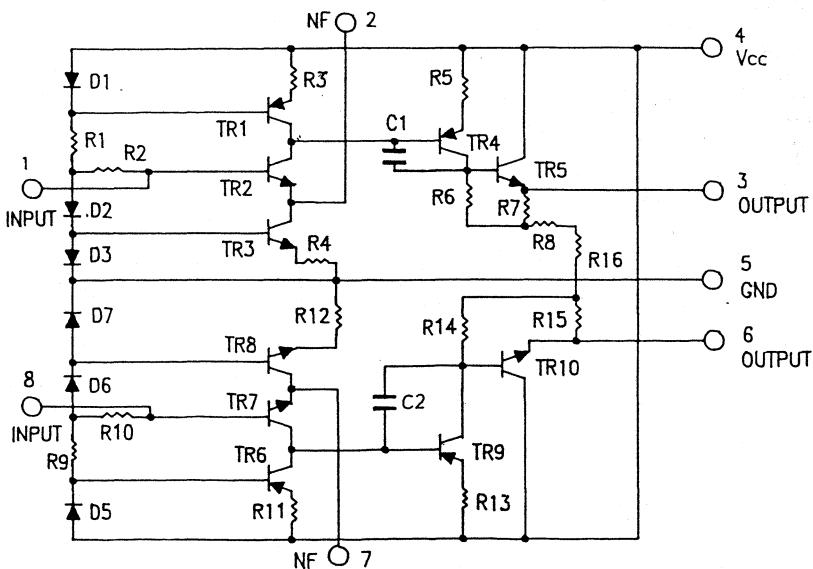
IC201 – LA3361

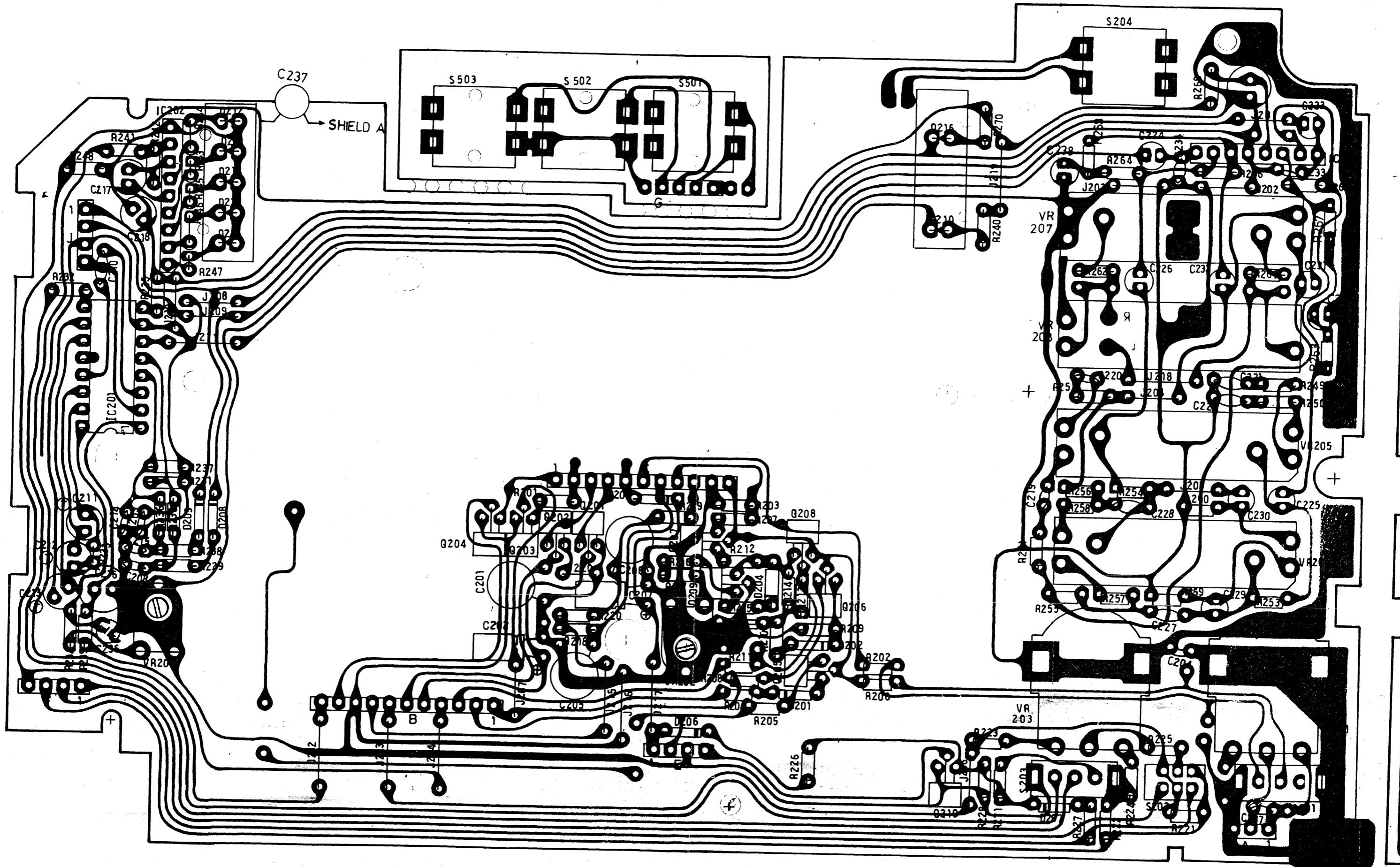


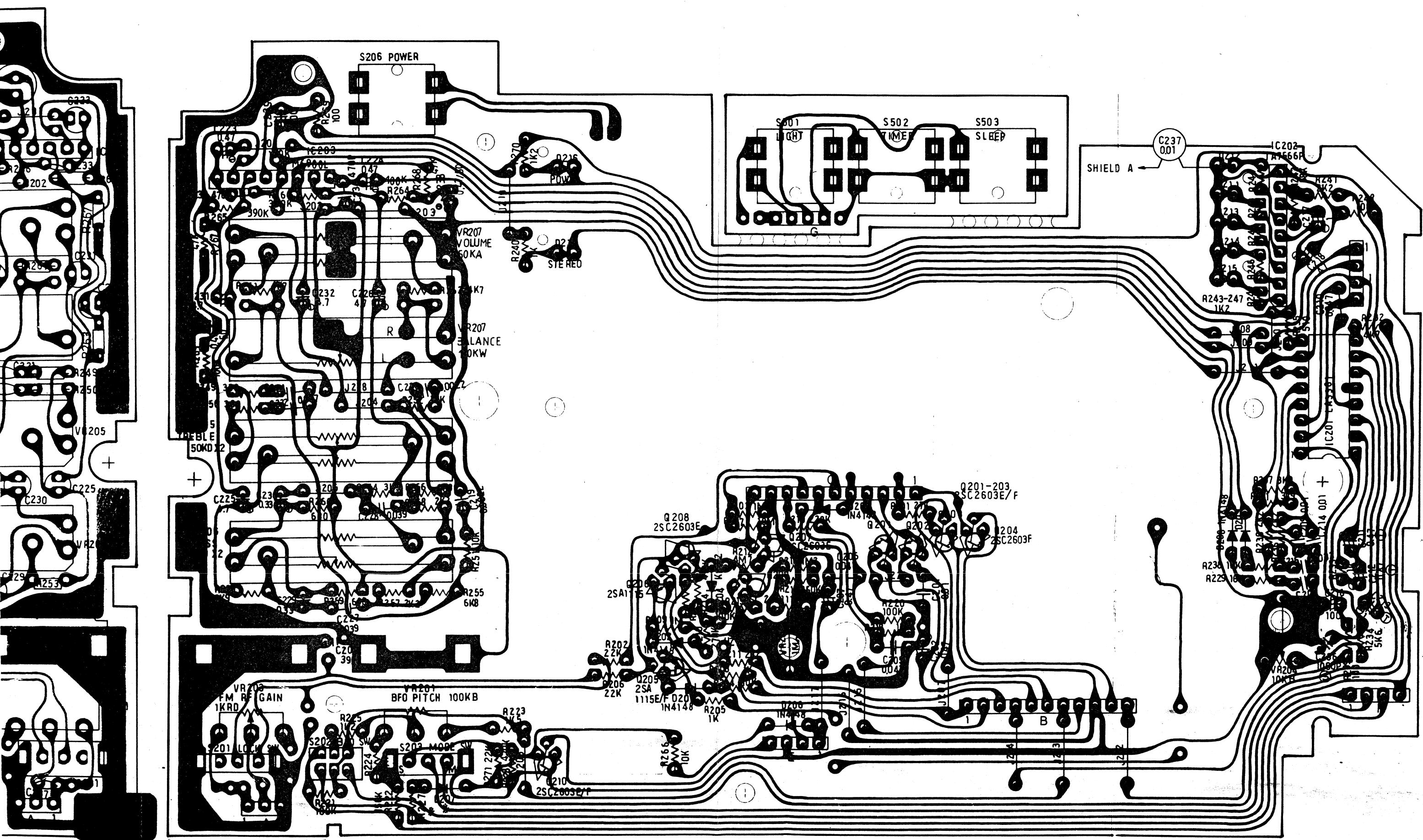
IC202 – TA7366P



IC203 – M6900L

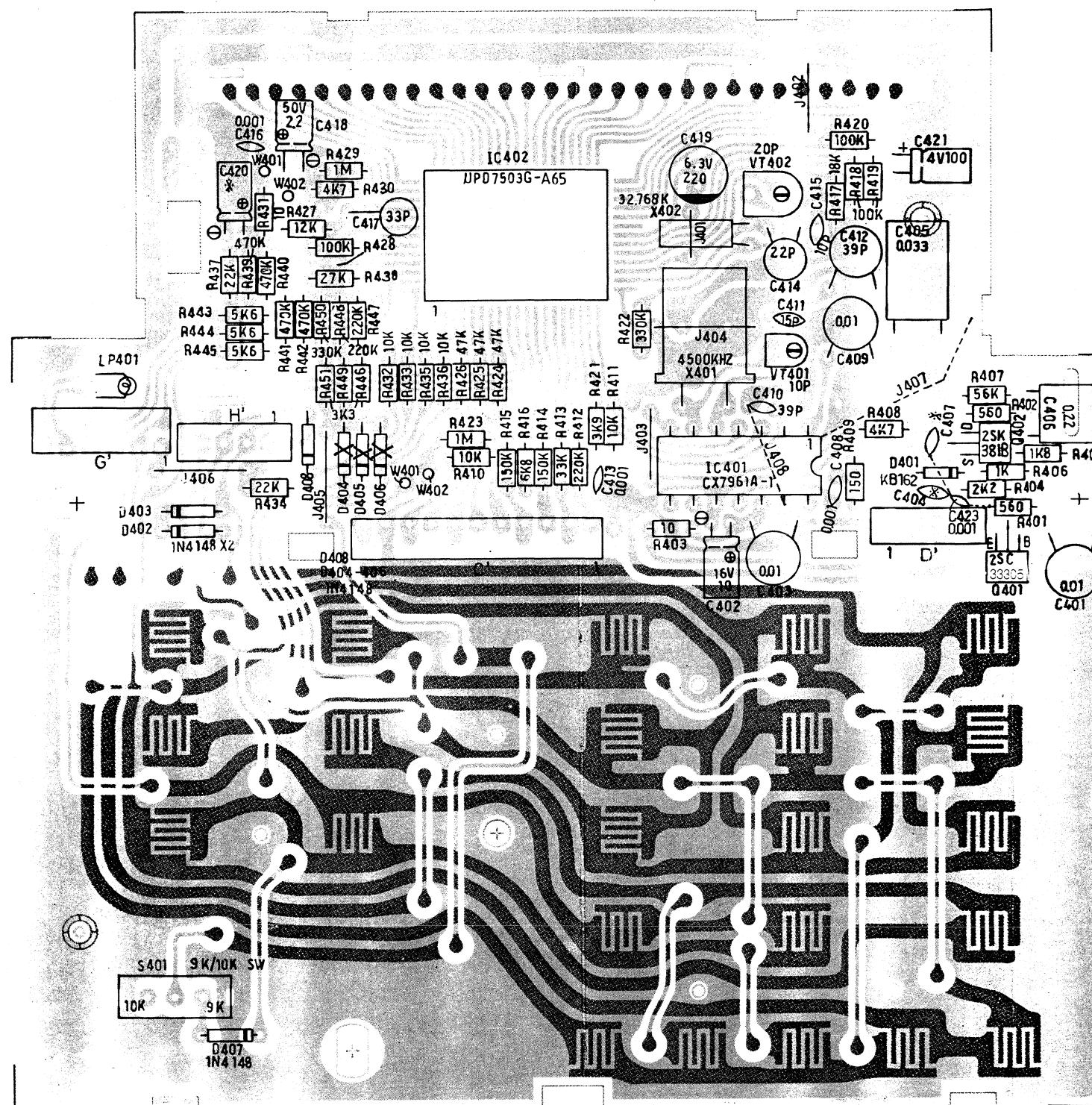




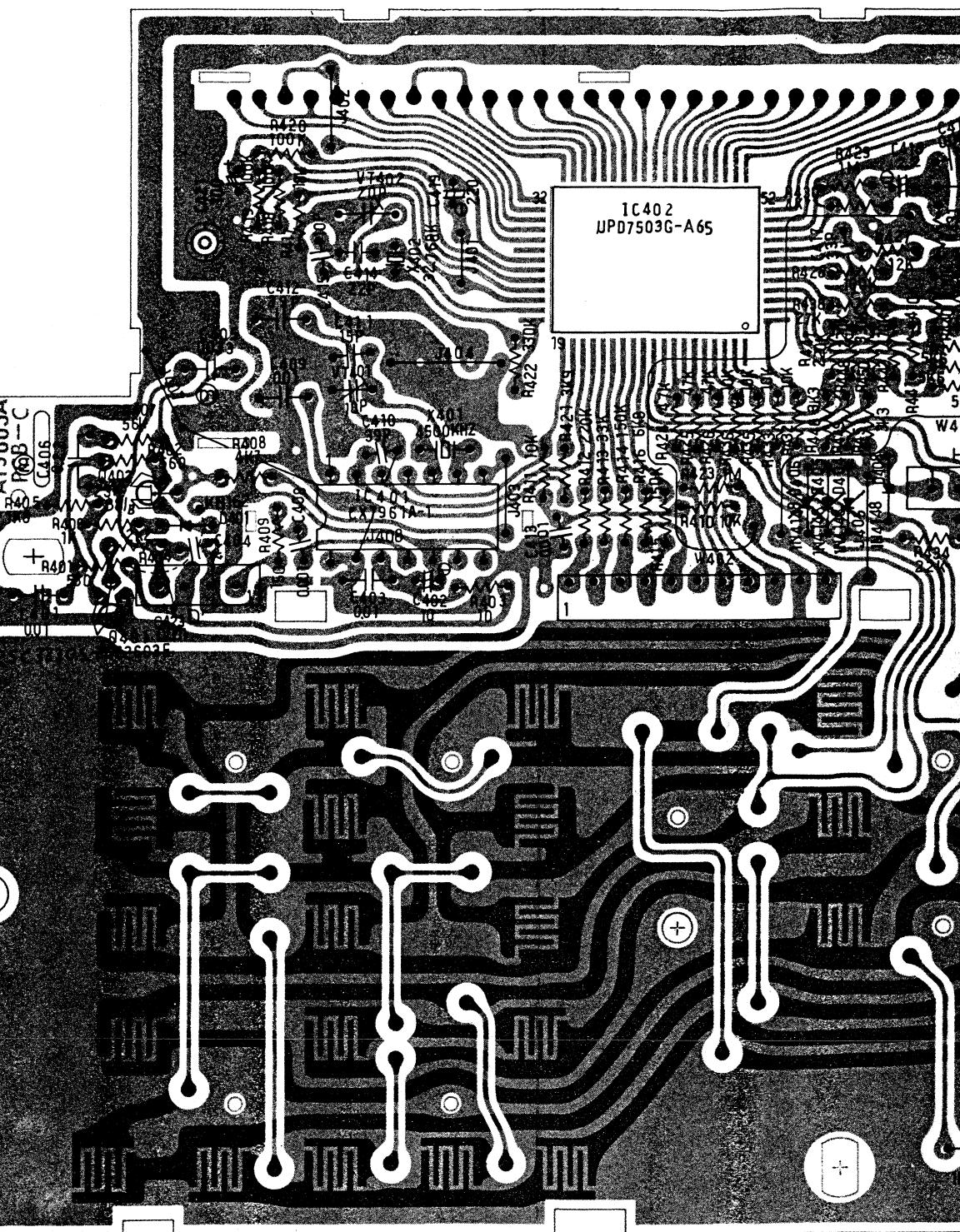


PLL- und Tastenfeldplatine/C-p.c.b.

Ident-Nr./order-no. 75 6536

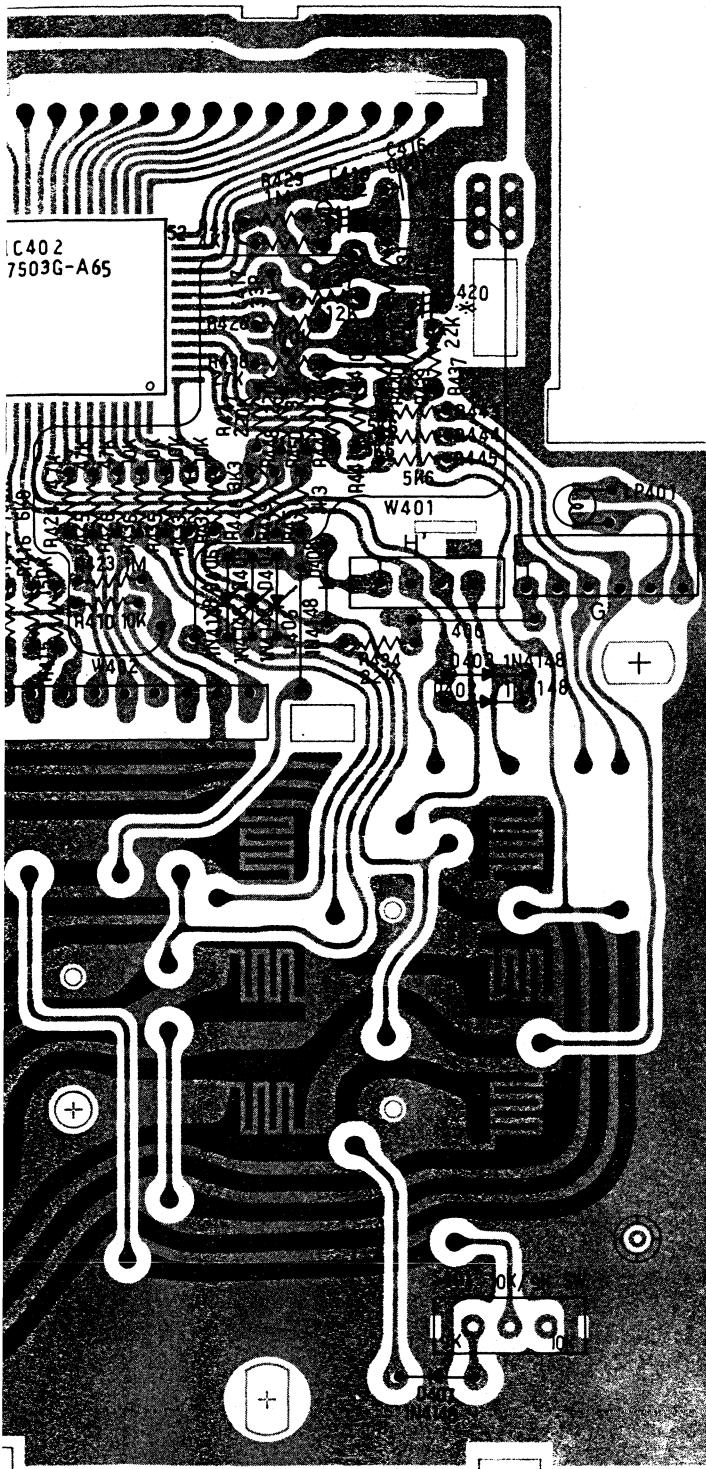


Bauteilseite/Top view



Leiterbahnseite/Bottom view

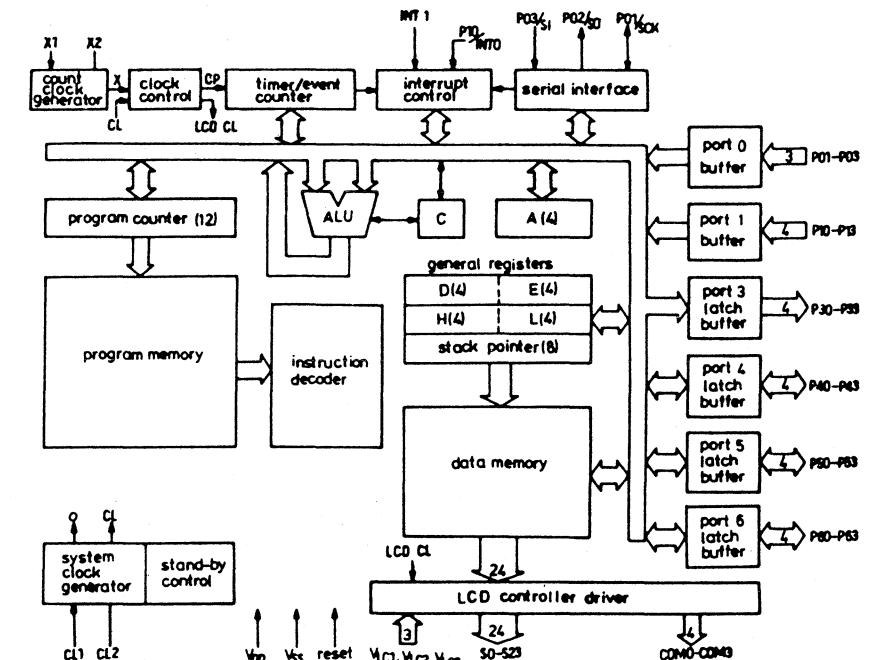
Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q401	B	0.51	0.51	0.51
	C	(5.17)	(1.74)	(1.95)
	E	0	0.0	0.0
Q402	G	1.09	1.09	0.02
	D	2.7	2.7	2.99
	S	1.25	1.25	1.25



Leiterbahnseite/Bottom view

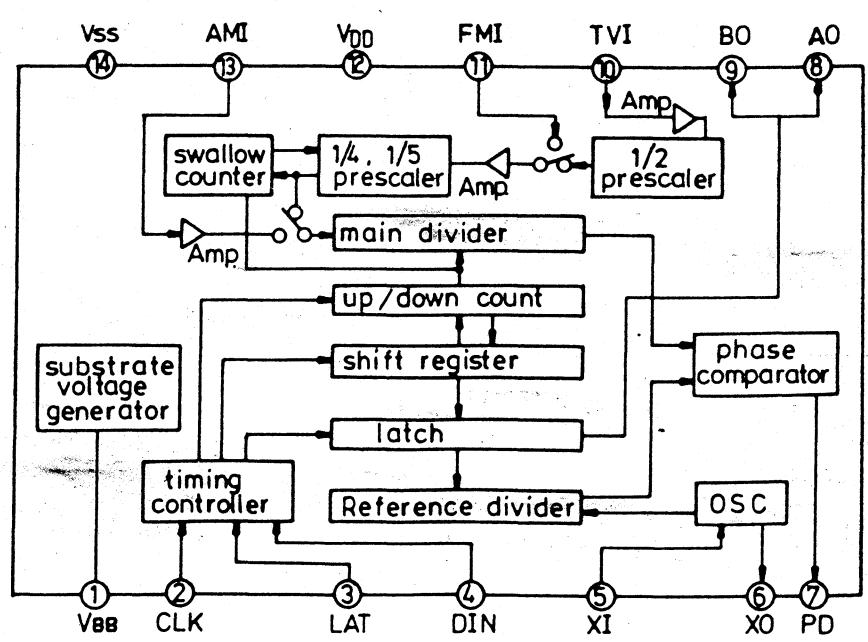
Typ	PIN	FM (V)	AM (V)	SSB/CW (V)
IC401	1	-1.53	-1.55	-1.53
	2	0.01	0.01	0.01
	3	0.01	0.01	0.01
	4	3.04	3.04	3.04
	5	1.27	1.27	1.27
	6	1.31	1.32	1.31
	7	1.09	1.09	1.09
	8	0.01	0	0
	9	0.01	2.31	2.31
	10	0.0	0.0	0
	11	1.61	1.62	1.62
	12	2.95	2.96	2.95
	13	0.0	0	0.0
	14	0.0	0	0.0
IC402	1	NC	NC	NC
	2	OUTPUT PORTS (APPENDIX FIGURE 4)		
	3			
	4			
	5	2.9	2.9	2.9
	6	0	0	0
	7	2.9	2.9	2.9
	8	2.9	2.9	2.9
	9	2.9	2.9	2.9
	10	2.9	2.9	2.9
	11	2.9	2.9	2.9
	12	0	2.9	2.9
	13	0.1	0.1	0.1
	14	2.9	0	0
	15	2.9	2.9	2.9
IC402	16	0	150K-1620 kHz: 2.9 1621K-29999 kHz: 0	
	17	0.1	0.1	0.1
	18	2.9	2.9	2.9
	19	2.9	2.9	2.9
	20	1.5	1.5	1.5
	21	1.5	1.5	1.5
	22	0	0	0
	23	0.15	0.15	0.15
	24	1.1	1.1	1.1
	25	2.0	2.0	2.0
	26	2.9	2.9	2.9
	27	NC	NC	NC
	28	COM2 COM1 COM0		
	29			
	30			
IC402	31	LCD SEGMENT		
	55	0	0	0
	56	0	0	0
	57	1.5	1.5	1.5
	58	2.9	2.9	2.9
	59	1.5	1.5	1.5
	60	2.8	2.8	2.8
	61	2.8	2.8	2.8
	62	2.8	2.8	2.8
	63	2.8	2.8	2.8
	64	OUTPUT PORTS (APPENDIX FIGURE 4)		

IC402 – μPD7503G-A65



P33	P0/INT0	S3
P32	P11	S4
P31	P12	S5
P30	P13	S6
P03/SI	P14	S7
P02/SO	P15	S8
P01/SCK	P16	S9
P63	P17	S10
P62	P18	S11
P61	P19	S12
P60	P20	S13
P53	P21	S14
P52	P22	S15
P51	P23	S16
P50	P24	S17
P43	P25	S18
P42	P26	S19
P41	P27	S20
P40	P28	S21
X1	VCC1	
VSS	VCC2	
AM1	VCC3	
VDD	S0-S23	
FMI	LCD CL	
TVI	24	
BO	INT 1	
A0	RESET	

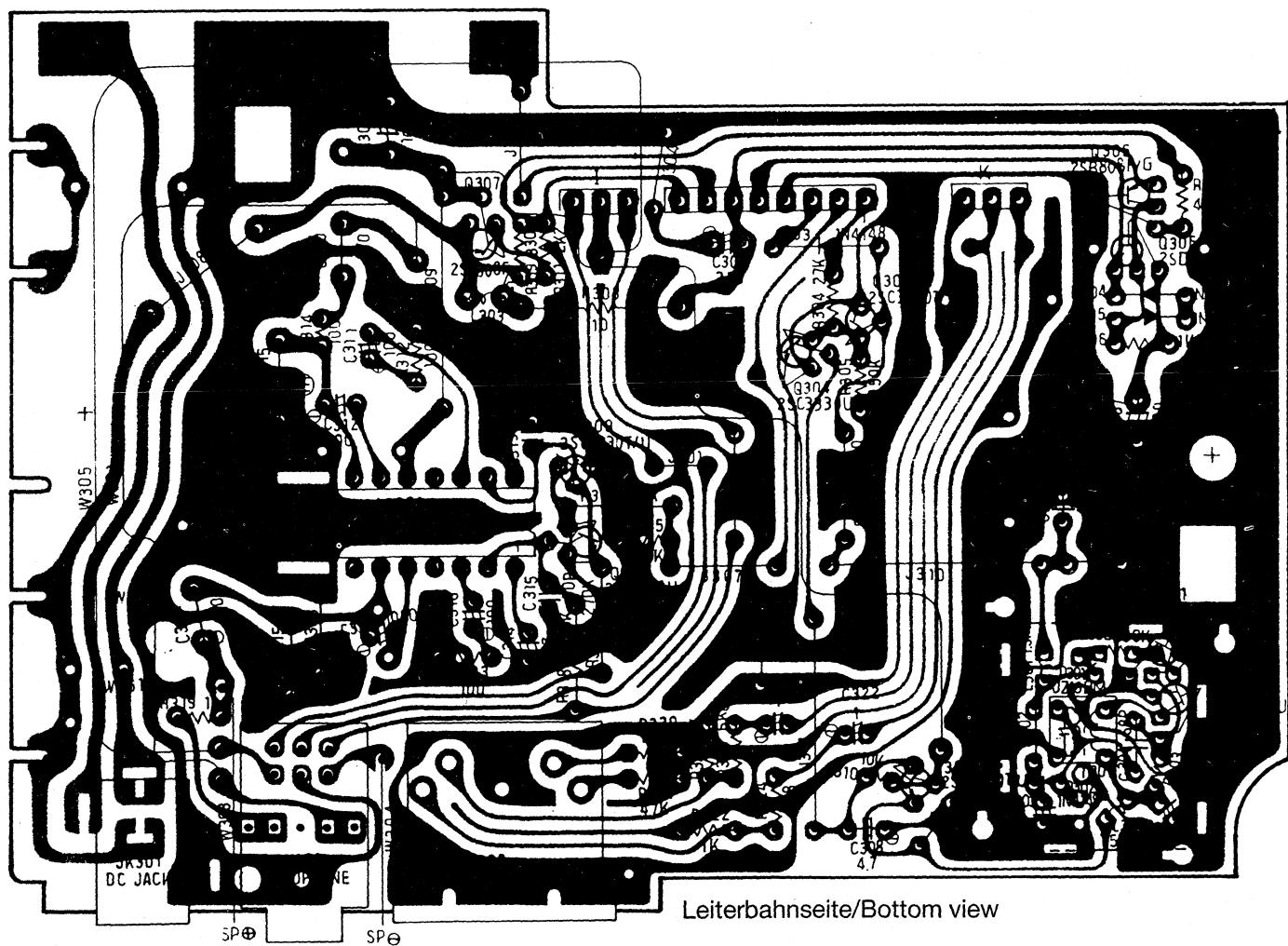
IC401 – CX-7961A-1



NF-Endverstärker-/Gleichspannungsconverterplatine

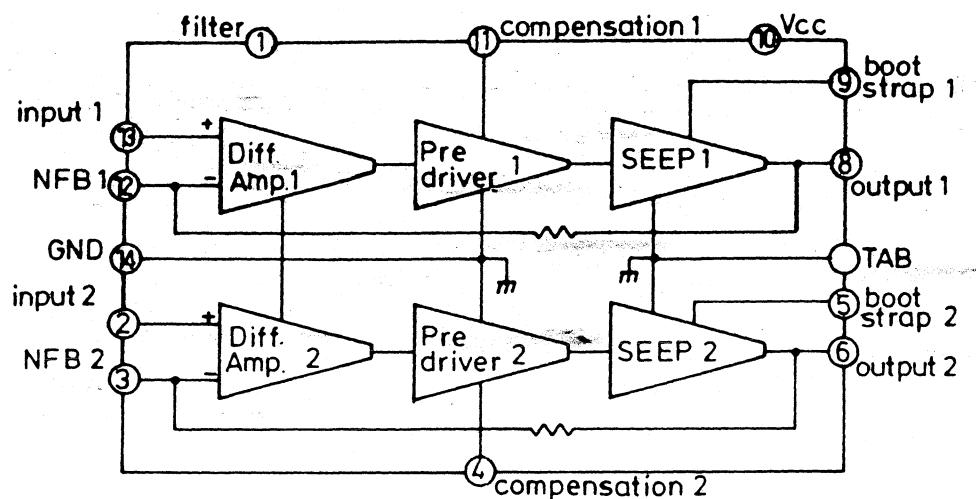
B-p.c.b.

Ident-Nr./order-no. 75 6580



Leiterbahnseite/Bottom view

IC301 – μPC1263C2 oder μPC1316C2 oder μPC1316C



Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q301	B	0.61	0	0.61
	C	(-2.07)	0	(-2.28)
	E	0	0	0
Q302	B	(-2.07)	0.44	(-2.28)
	C	7.89	0.88	7.86
	E	0	0	0
Q303	B	0.01	0.63	0.28
	C	14.09	0.03	14.09
	E	0	0	0
Q304	B	0.01	0.63	0.28
	C	8.59	1.57	8.59
	E	0	0	0

Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q305	B	7.27	7.38	7.37
	C	7.93	8.04	8.04
	E	8.00	8.11	8.10
Q306	B	7.58	7.73	7.72
	C	7.93	8.04	8.04
	E	6.88	7.05	7.03
Q307	B	8.21	8.21	8.21
	C	8.92	8.93	8.92
	E	8.94	8.95	8.94
Q308	B	8.59	1.57	8.59
	C	8.92	8.93	8.92
	E	7.91	0.93	7.92

Typ	An-schluß	FM (V)	AM (V)	SSB/CW (V)
Q309	B	1.45	0.93	3.21
	C	0.	0	0
	E	0	0	0
Q310	B	1.45	0.93	3.21
	C	0	0	0
	E	0	0	0

BAUTEILANSCHLUSSIDENTIFIKATION

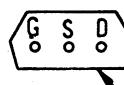
SEMICONDUCTOR LEAD IDENTIFICATIONS

Transistors

MARKING SIDE

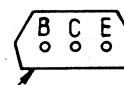


2SK152



2SK212

MARKING SIDE



2SA1317
2SB808
2SC3330
2SC2999
2SC2839
2SD1012



2SK46

MARKING

Diodes



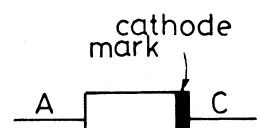
1N4148



KB162



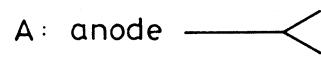
KB262



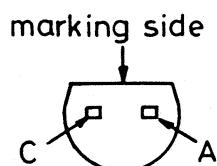
1S2222



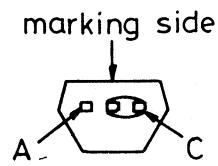
C: cathode



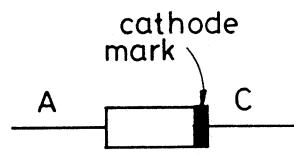
A: anode



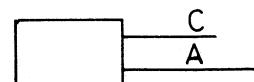
FC 52M-5/6



SVC-201SP



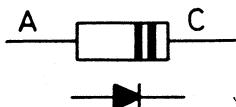
UZ-13BM
UZ-10BM



RP-5551K - RED
RG-5551KY - GRN



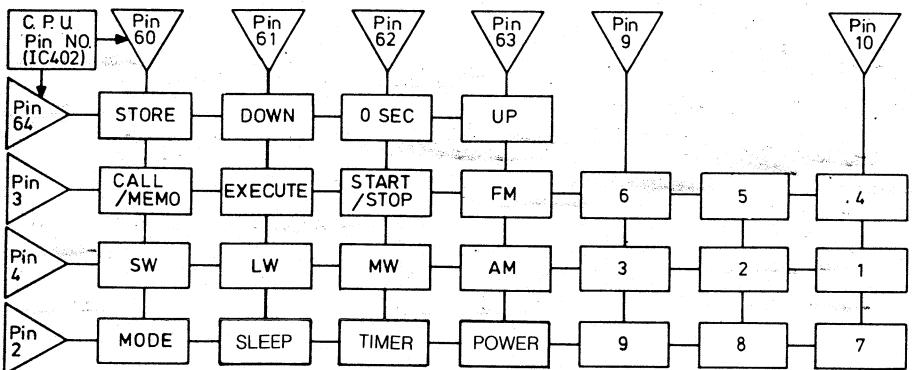
1N60



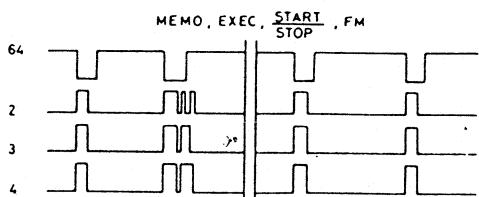
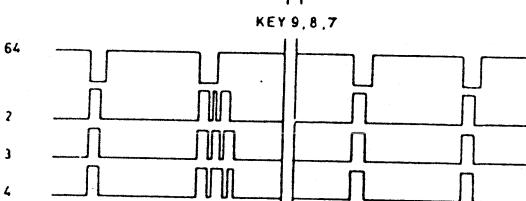
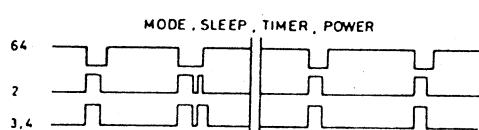
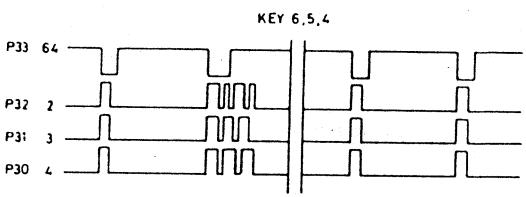
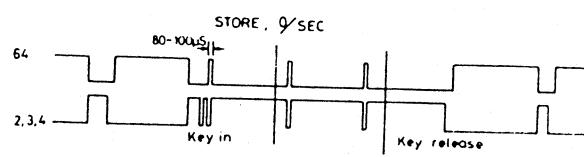
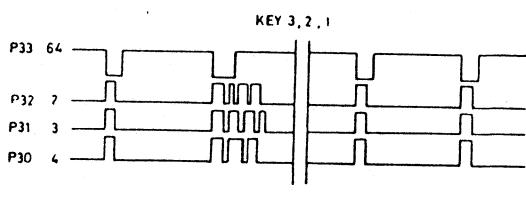
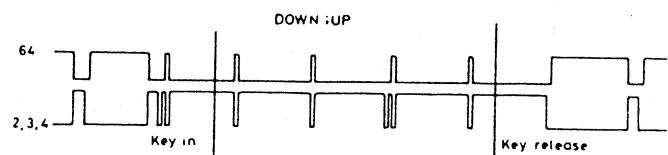
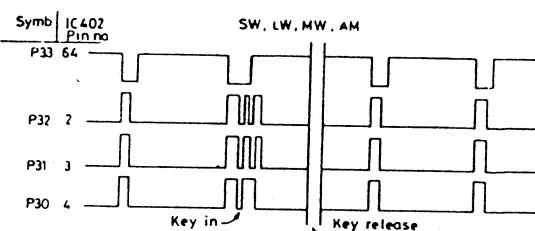
1N60P

IC-Zusatzzdaten/Additional IC-data

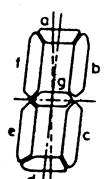
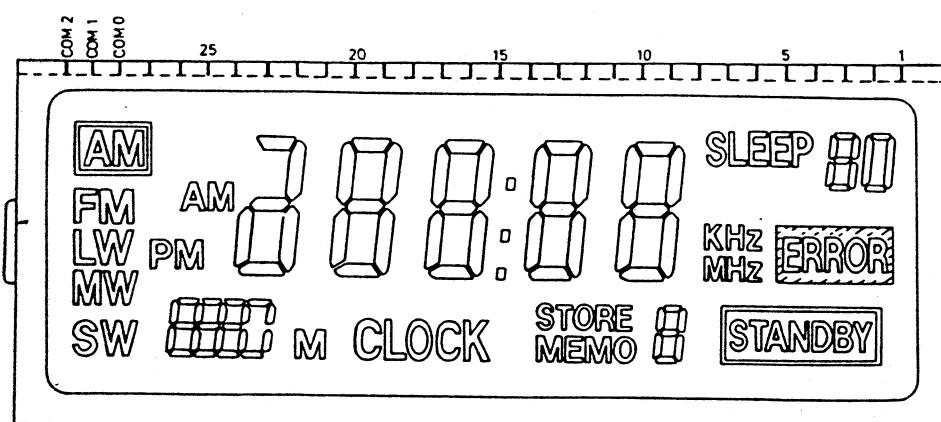
IC 402 μPD7503G-A65 Tastenfeldmatrix/Keyboard matrix



Pulsdiagramme/Timing diagram



LCD am IC 402/LCD at IC 402 (LD-BU7140J)



Pin-Anschlüsse LCD

Pin Connection

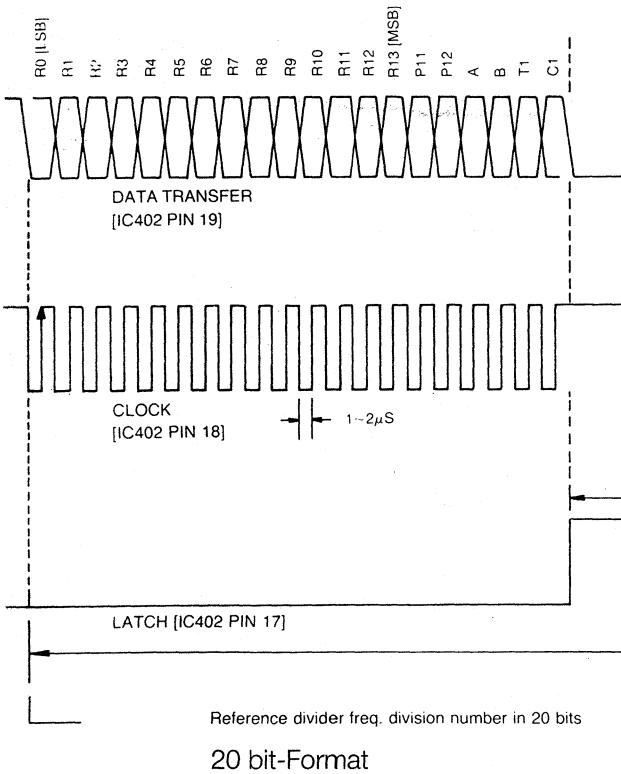
PIN NO IC402	28	29	30	PIN NO LCD
	COM 2	COM 1	COM 0	
54	12b	12c	Stand by	1
53	12a	12g	12d	2
52	12f	12e	MHz FM <input type="checkbox"/> (Dot)	3
51	6b	6c	ERROR	4
50	6a	6g	6d	5
49	6f	6e	SLEEP <input type="checkbox"/>	6
48	5b	5c	kHz	7
47	5a	5g	5d	8
46	5f	5e	STORE	9
45	4b	4c	MEMO	10
44	4a	4g	4d	11
43	4f	4e	<input type="checkbox"/> <input type="checkbox"/> COLON	12

PIN NO IC402	28	29	30	PIN NO LCD
	COM 2	COM 1	COM 0	
42	3b	3c	LW	13
41	3a	3g	3d	14
40	3f	3e	MW	15
39	2b	2c	CLOCK	16
38	2a	2g	2d	17
37	2f	2e	1a 1d 1e 1g	18
36	1b	1c	(Time) AM	19
35	10f	11f	11a 11b 11c 11d 9a 9d 9g	20
34	8a	—	—	21
33	8g	8f	9f	22
34	—	8e	9e	23
32	8d		PM	24
31	10a 10d 10g	11e SW M	10e	25

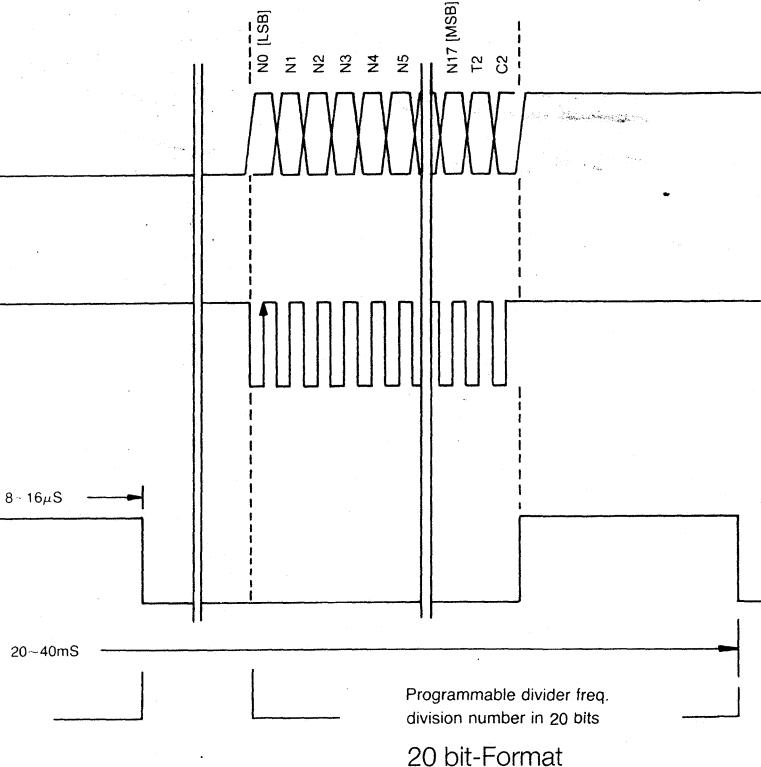
IC401 CX7961A-1

Pin-Nr. Pin-no.	Pin-Name Pin-name	Eing./Ausg. Input/Output	Pinfunktion	Pinfunction
1	V _{BB}		Trägermaterial, über C409 nach Masse	Substrate terminal, via C409 to ground
2	CLK	E, I	Takt für Pin 4, die Anstiegsflanken werden verwendet	Clock for Pin 4
3	LAT	E, I	Latchsignal für Schieberegisterdaten wie „up“ und „down“	Latch signal for shift register data as up and down
4	DIN	E, I	Daten im 20 bit-Format und „up“-„down“-Daten	20 bit frame data and up/down-Data
5	XI	E, I	Oszillatoranschluß für 4,5 MHz-Quarz	Reference oscillator terminal for 4.5 MHz crystal
6	XO	A, O	Oszillatoranschluß für 4,5 MHz-Quarz	Reference oscillator terminal for 4.5 MHz crystal
7	PD	A, O	Anschluß am Phasenkomparator, 3 Spannungszustände, AM/FM-Abstimmspannung	Phase comparator terminal (3 states) AM/FM-tuning signal
8	AO	A, O	Nicht verwendet	Not used
9	BO	A, O	Nicht verwendet	Not used
10	TVI	E, I	Nicht verwendet (180/240 MHz)	Not used (180/240 MHz)
11	FMI	E, I	FM/AM-Oszillatorkreisfrequenz	FM/AM-oscillator frequency
12	V _{DD}		Spannungsversorgung (+ 3 V)	Power supply (+ 3 V)
13	AMI	E, I	Nicht verwendet, Masseanschluß, sonst AM-Oszillatorkreisfrequenz	Not used, connection to ground, otherwise AM-oscillator frequency
14	V _{SS}		Ground	Masse

Frequenzteilung der Referenzoszillatorfrequenz



Frequenzteilung des programmierbaren Teilers



Frequenzteilung

$$N = \frac{f_{LCD} (\text{kHz}) + f_0 (\text{kHz})}{1 (\text{kHz})} - 8$$

N = Teilungsverhältnis, division number

f_{LCD} = LCD-Frequenz, LCD-Frequency

F_0 = Oszillatorkreisfrequenz

Beispiel 1/Example 1

$$f_{LCD} = 100 \text{ MHz}, \quad f_0 = 10,7 \text{ MHz}$$

$$N = \frac{100000 + 10700}{1} - 8 = \frac{110700}{1} - 8 = 110692$$

Beispiel 2/Example 2

$$f_{LCD} = 10 \text{ MHz}, \quad f_0 = 55,845 \text{ MHz}$$

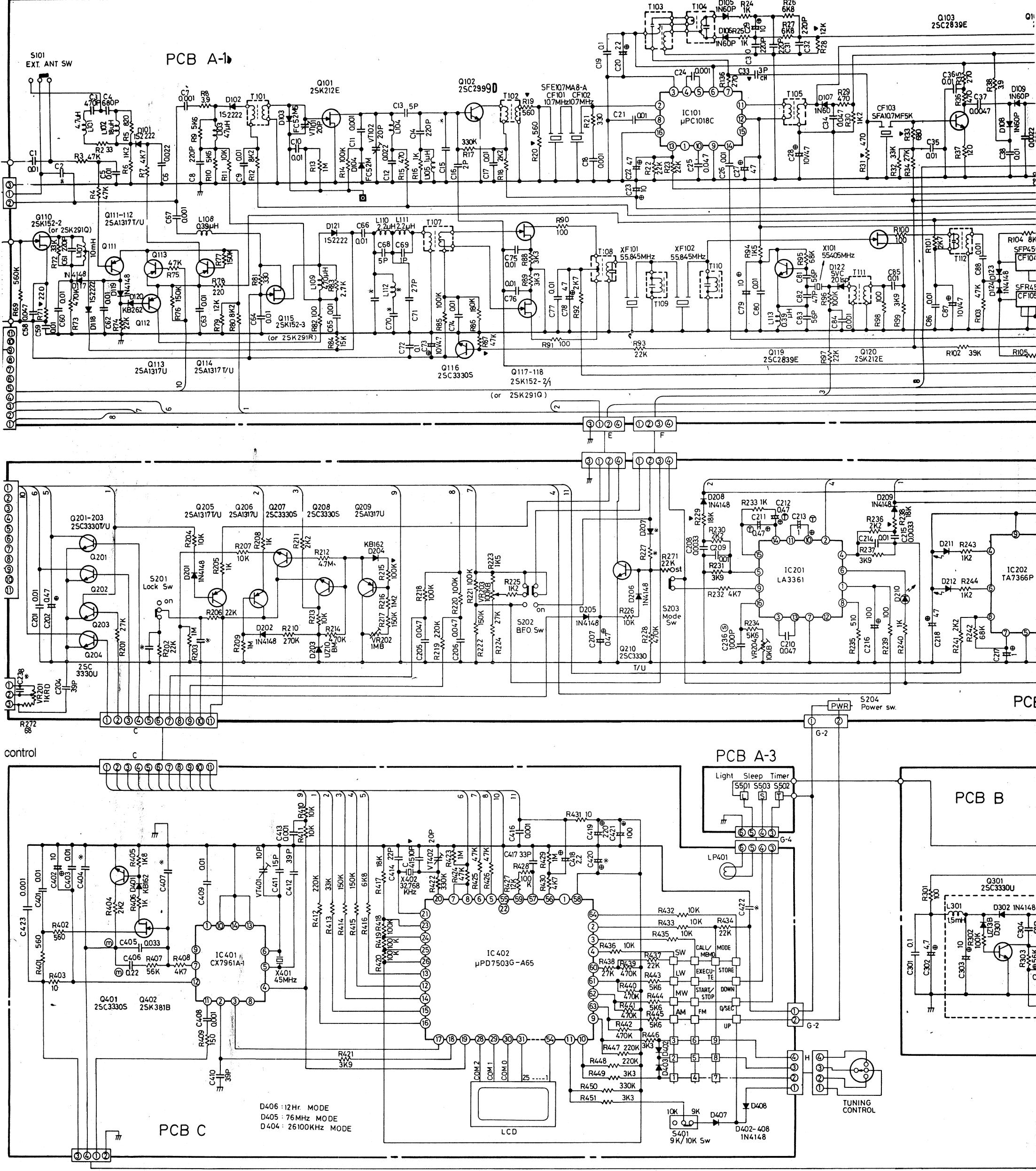
$$N = \frac{10000 + 55845}{1} - 8 = \frac{65845}{1} - 8 = 65837$$

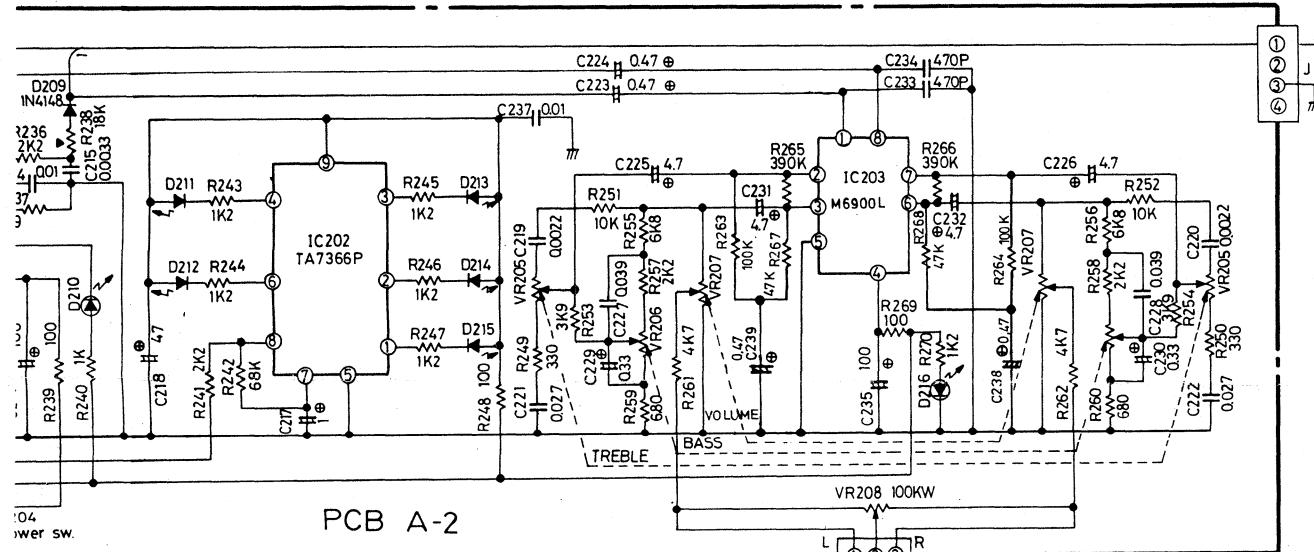
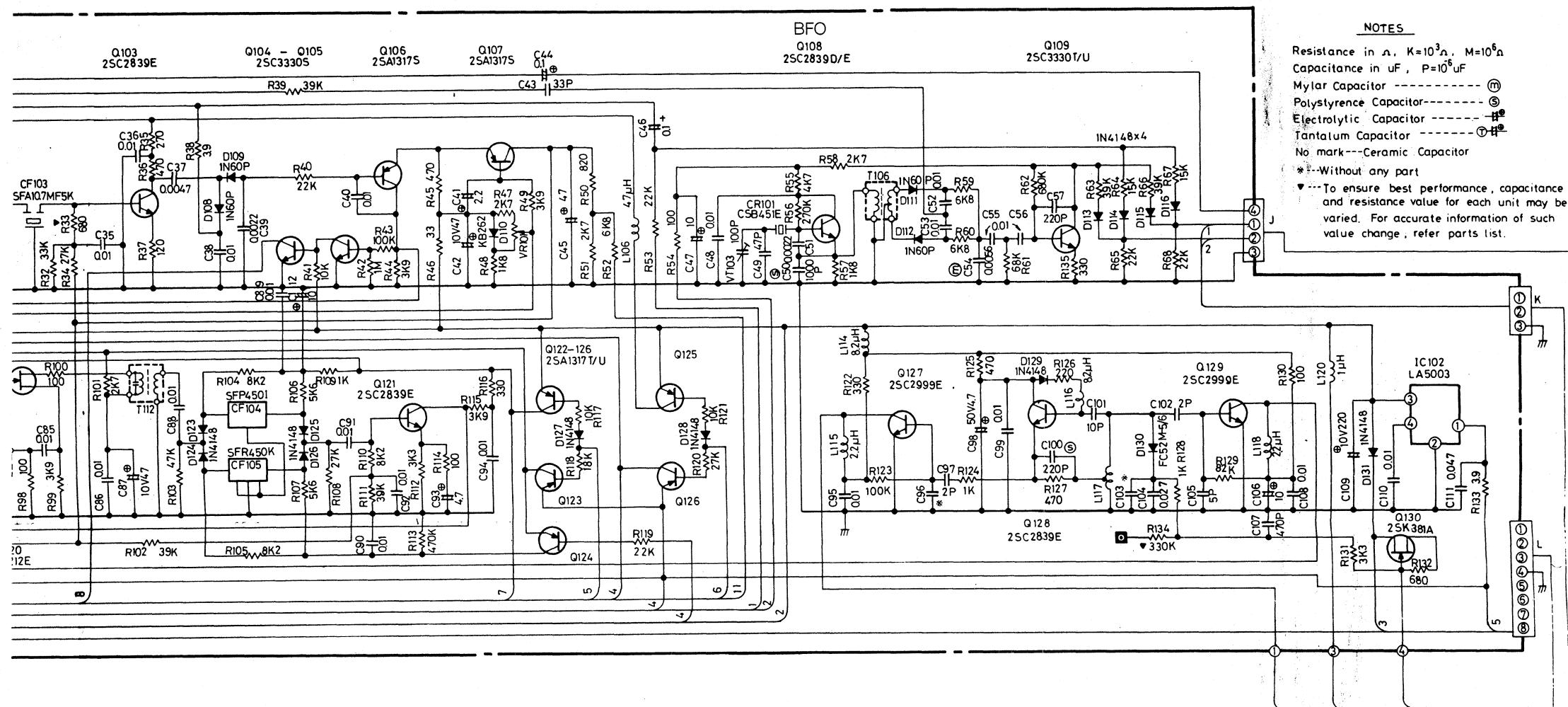
IC 402 µPD7503G-A65

Pin-Nr. Pin-no	Pin-Name Pin-name	Eing./ Ausg. Input/ Output	Pinfunktion	Pinfunction
1	NC		Im IC nicht angeschlossen	Not connected
2	P 32	A/O	Für die Bedienfeldmatrix	For key matrix (strobe)
3	P 31	A/O	Für die Bedienfeldmatrix	For key matrix
4	P 30	A/O	Für die Bedienfeldmatrix	For key matrix
5	P 03/SI	E/I	Sperrfunktion/H = Radio ein	Inhibit /H = Radio on
6	P 02/SO	E/I	Stop-Funktion bei FM/AM-Abstimmung H = Stop und Frequenz wird angezeigt	Auto scan stop when FM/AM-scan H = Stop and frequency indicated on display
7	P 01/SCK		Keine Funktion	Not used
8	P 63		Verriegelungsfunktion/H = entriegelt L = alle Tasten sind verriegelt	Lock function control/H = released L = locked, push buttons
9	P 62	E/I	Für die Bedienfeldmatrix	For key matrix
10	P 61	E/I	Für die Bedienfeldmatrix	For key matrix
11	P 60	E/I	Für die Bedienfeldmatrix und AM-Frequenz- umstellung	For key matrix and AM-frequency modification
12	P 53	A/O	H = Radio ein und AM-Empfang L = Radio aus, kein Empfang	H = while radio on and AM-reception L = while radio off and non-AM-reception
13	P 52	A/O	Stummschaltung, H = aktiv	Mute, H = active
14	P 51	A/O	H = Radio ein und FM-Empfang L = Radio aus und kein FM-Empfang	H = while radio on and FM-reception L = while radio off and non-FM-reception
15	P 50	A/O	H = Radio ein/L = Radio aus	H = while radio on/L = while radio off
16	P 43	A/O	H = Wenn AM bei 150 ... 1620 kHz L = Wenn AM \geq 1621 kHz	H = while AM-reception in 150 ... 1620 kHz L = while AM-reception over 1621 kHz
17	P 42	A/O	Schaltsignal zum Schieberegister (IC401)	Latch signal to shift register (IC401)
18	P 41	A/O	Takt für IC401	Clock for IC401
19	P 40	A/O	Daten zur Teilung der Referenzfrequenz und Teilung des programmierbaren Teilers	Data for reference divider frequency division number and programmable divider frequency division number
20	X2		Außenanschluß für frequenzbestimmende Bauteile des Oszillators, 32,768 MHz	Crystal clock pin 32,768 MHz
21	X1		Außenanschluß für frequenzbestimmende Bauteile des Oszillators 32,768 MHz	Crystal clock pin 32,768 MHz
22	V _{ss}		Spannungsversorgung	LCD bias voltage
23	VLC 3	E/I	Für Energieversorgung des „Displays“	LCD bias voltage
24	VLC 2	E/I	Für Energieversorgung des „Displays“	LCD bias voltage
25	VLC 1	E/I	Für Energieversorgung des „Displays“	LCD bias voltage
26	VDD		Energieversorgung 2,8 ... 3,1 V	Apply voltage from 2.8 to 3.1 V
27	COM 3	A/O	COM 3-Anschluß, nicht verwendet	COM 3 LCD backplane driver, not used
28	COM 2	A/O	COM 2-System zum Display	COM 3-System terminal to display
29	COM 1	A/O	COM 2-System zum Display	COM 2-System terminal to display
30	COM 0	A/O	COM 0-System zum Display	COM 0-System terminal to display
31 ↓ 54	S 23	A/O	Digitansteuerung in Verbindung mit COM-System, näheres Seite 31	LCD segment driver combined with COM-System, see page 31

Pin-Nr. Pin-no	Pin-Name Pin-name	Eing./ Ausg. Input/ Output	Pinfunktion	Pinfunction
55	INT 1	E/I	Keine Gerätefunktion, Masseverbindung L = Normalbetrieb/H = am Anfang	Not used and without any function L = while normal mode/H = while initialized
56	RESET	E/I	Bauteilanschluß für Systemtakt	Terminal for system clock
57	CL 1	E/I	Energieversorgung 2,8...3,1V	Apply voltage from 2.8 to 3.1 V
58	VDD		Bauteilanschluß für Systemtakt	Terminal for system clock
59	CL 2			
60	P 13	E/I	Für die Bedienfeldmatrix und FM-Frequenzumstellung	For key matrix and FM-frequency modification
61	P 12	E/I	Für die Bedienfeldmatrix und Abstimmsschritt-Frequenzumstellung	For key matrix and auto scan step frequency modification
62	P 11	E/I	Für die Bedienfeldmatrix	For key matrix
63	P 10/INTO	E/I	Für die Bedienfeldmatrix	For key matrix
64	P 33	A/O	Für die Bedienfeldmatrix	For key matrix (strobe)

Notizen





	FINISHED NO.	VACANCY NO.
PCB A-1	R1-136, C1-112 Q101-130, D101-131 L101-120	R70,20 C2,15,103,70,96
PCB A-2	R201-271, C201-239 Q201-210, D201-216	R227, 267-268 C203 D207
PCB B	R301-325, C301-323 Q301-310, D301-305	
PCB C	R401-451, C401-423 Q401-402	C407,422, 404, 420

BOTTOM VIEW



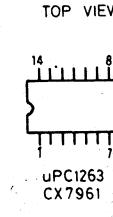
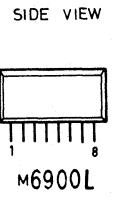
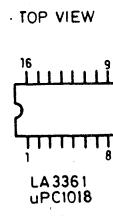
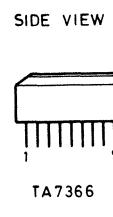
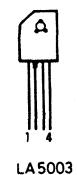
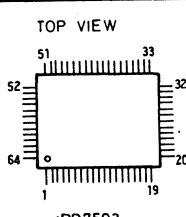
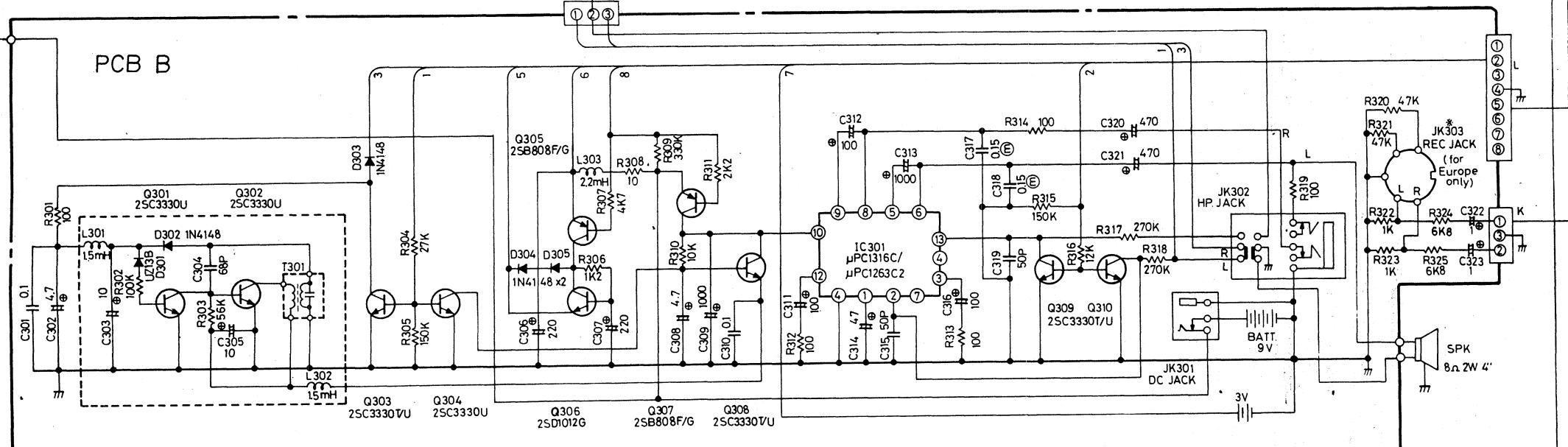
(BCE)

2SK152

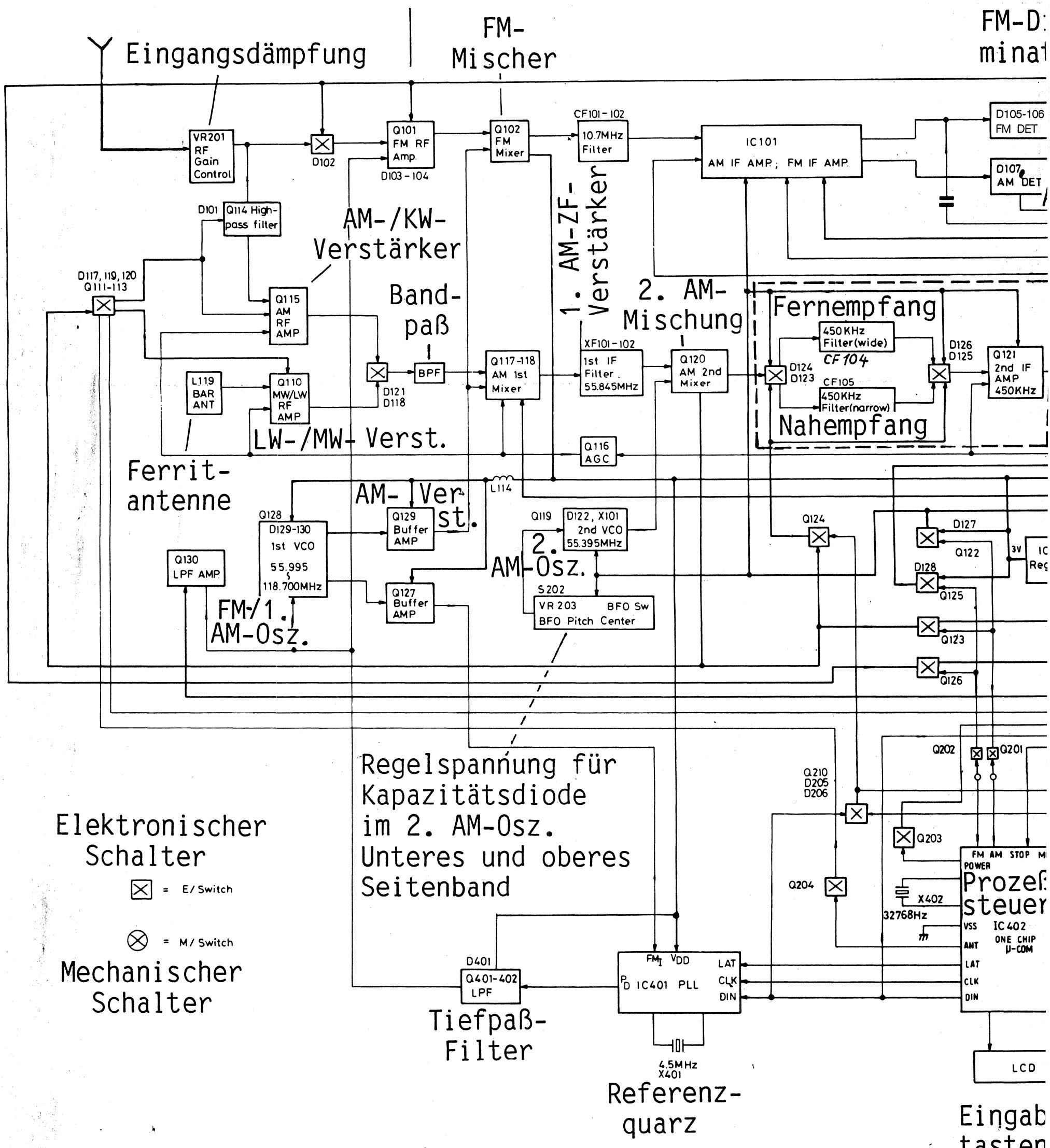
2SK381

2SKZ12

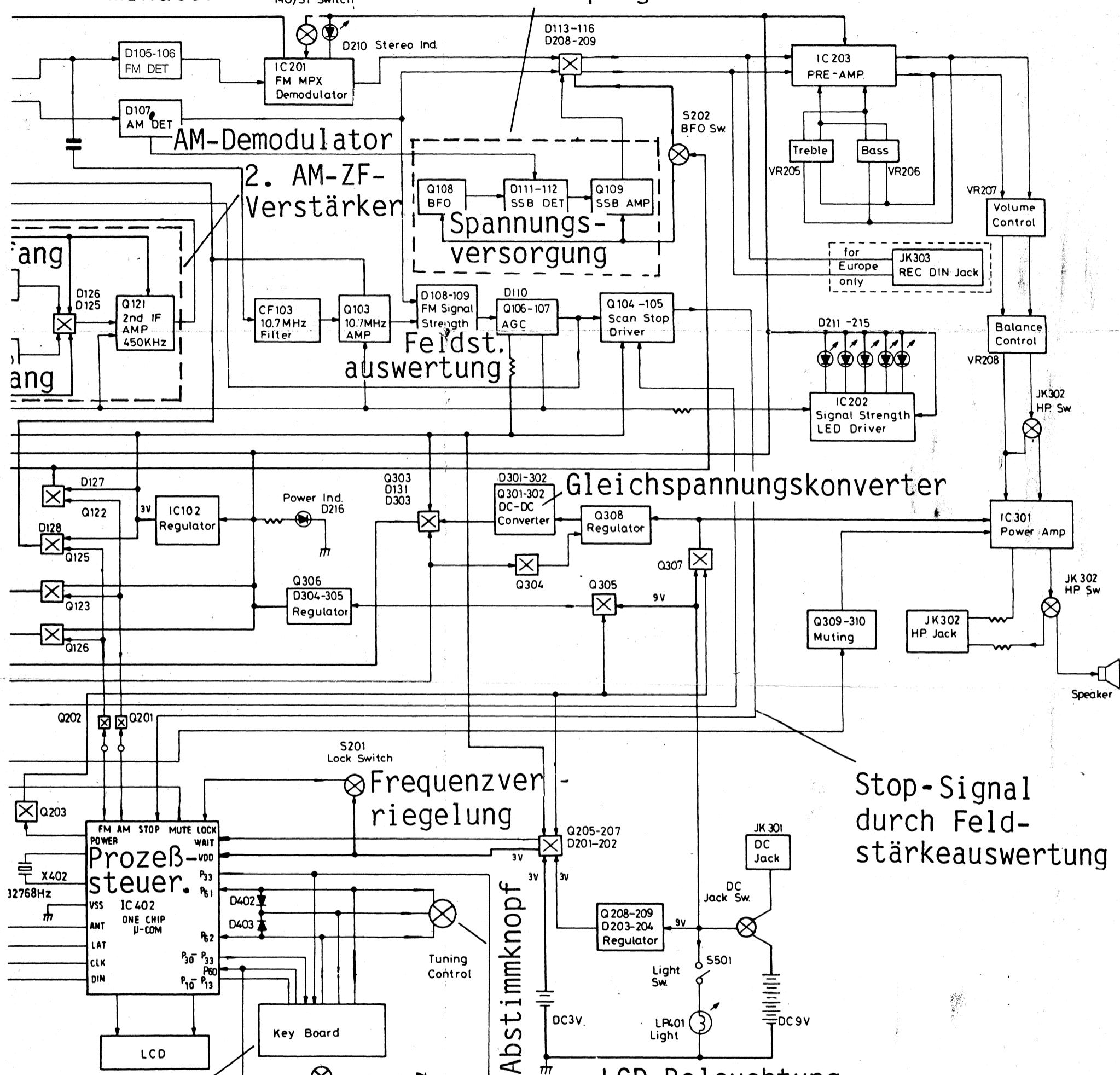
2SA1317
2SB808
2SC3330
2SC2999
2SC2839
2SD1012



HF-Vorverstärker f. FM



FM-Discriminator (nah - weit) Für Einseitenbandempfang NF-Vorverstärker



Eingabetastenfeld 9 kHz/10 kHz
Schrittschalter Amerika/Europa